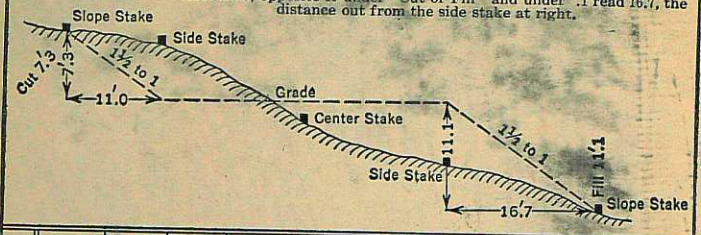
#63
63 - 1 - 1950

## DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

**Roadway of any Width. Side Slopes 1½ to 1.**

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.




| Cut or Fill | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | Cut or Fill |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Distance out from Side or Shoulder Stake | | | | | | | | | | |
| 0 | 0.0 | 0.2 | 0.3 | 0.5 | 0.6 | 0.8 | 0.9 | 1.1 | 1.2 | 1.4 | 0 |
| 1 | 1.5 | 1.7 | 1.8 | 2.0 | 2.1 | 2.3 | 2.4 | 2.6 | 2.7 | 2.9 | 1 |
| 2 | 3.0 | 3.2 | 3.3 | 3.5 | 3.6 | 3.8 | 3.9 | 4.1 | 4.2 | 4.4 | 2 |
| 3 | 4.5 | 4.7 | 4.8 | 5.0 | 5.1 | 5.3 | 5.4 | 5.6 | 5.7 | 5.9 | 3 |
| 4 | 6.0 | 6.2 | 6.3 | 6.5 | 6.6 | 6.8 | 6.9 | 7.1 | 7.2 | 7.4 | 4 |
| 5 | 7.5 | 7.7 | 7.8 | 8.0 | 8.1 | 8.3 | 8.4 | 8.6 | 8.7 | 8.9 | 5 |
| 6 | 9.0 | 9.2 | 9.3 | 9.5 | 9.6 | 9.8 | 9.9 | 10.1 | 10.2 | 10.4 | 6 |
| 7 | 10.5 | 10.7 | 10.8 | 11.0 | 11.1 | 11.3 | 11.4 | 11.6 | 11.7 | 11.9 | 7 |
| 8 | 12.0 | 12.2 | 12.3 | 12.5 | 12.6 | 12.8 | 12.9 | 13.1 | 13.2 | 13.4 | 8 |
| 9 | 13.5 | 13.7 | 13.8 | 14.0 | 14.1 | 14.3 | 14.4 | 14.6 | 14.7 | 14.9 | 9 |
| 10 | 15.0 | 15.2 | 15.3 | 15.5 | 15.6 | 15.8 | 15.9 | 16.1 | 16.2 | 16.4 | 10 |
| 11 | 16.5 | 16.7 | 16.8 | 17.0 | 17.1 | 17.3 | 17.4 | 17.6 | 17.7 | 17.9 | 11 |
| 12 | 18.0 | 18.2 | 18.3 | 18.5 | 18.6 | 18.8 | 18.9 | 19.1 | 19.2 | 19.4 | 12 |
| 13 | 19.5 | 19.7 | 19.8 | 20.0 | 20.1 | 20.3 | 20.4 | 20.6 | 20.7 | 20.9 | 13 |
| 14 | 21.0 | 21.2 | 21.3 | 21.5 | 21.6 | 21.8 | 21.9 | 22.1 | 22.2 | 22.4 | 14 |
| 15 | 22.5 | 22.7 | 22.8 | 23.0 | 23.1 | 23.3 | 23.4 | 23.6 | 23.7 | 23.9 | 15 |
| 16 | 24.0 | 24.2 | 24.3 | 24.5 | 24.6 | 24.8 | 24.9 | 25.1 | 25.2 | 25.4 | 16 |
| 17 | 25.5 | 25.7 | 25.8 | 26.0 | 26.1 | 26.3 | 26.4 | 26.6 | 26.7 | 26.9 | 17 |
| 18 | 27.0 | 27.2 | 27.3 | 27.5 | 27.6 | 27.8 | 27.9 | 28.1 | 28.2 | 28.4 | 18 |
| 19 | 28.5 | 28.7 | 28.8 | 29.0 | 29.1 | 29.3 | 29.4 | 29.6 | 29.7 | 29.9 | 19 |
| 20 | 30.0 | 30.2 | 30.3 | 30.5 | 30.6 | 30.8 | 30.9 | 31.1 | 31.2 | 31.4 | 20 |
| 21 | 31.5 | 31.7 | 31.8 | 32.0 | 32.1 | 32.3 | 32.4 | 32.6 | 32.7 | 32.9 | 21 |
| 22 | 33.0 | 33.2 | 33.3 | 33.5 | 33.6 | 33.8 | 33.9 | 34.1 | 34.2 | 34.4 | 22 |
| 23 | 34.5 | 34.7 | 34.8 | 35.0 | 35.1 | 35.3 | 35.4 | 35.6 | 35.7 | 35.9 | 23 |
| 24 | 36.0 | 36.2 | 36.3 | 36.5 | 36.6 | 36.8 | 36.9 | 37.1 | 37.2 | 37.4 | 24 |
| 25 | 37.5 | 37.7 | 37.8 | 38.0 | 38.1 | 38.3 | 38.4 | 38.6 | 38.7 | 38.9 | 25 |
| 26 | 39.0 | 39.2 | 39.3 | 39.5 | 39.6 | 39.8 | 39.9 | 40.1 | 40.2 | 40.4 | 26 |
| 27 | 40.5 | 40.7 | 40.8 | 41.0 | 41.1 | 41.3 | 41.4 | 41.6 | 41.7 | 41.9 | 27 |
| 28 | 42.0 | 42.2 | 42.3 | 42.5 | 42.6 | 42.8 | 42.9 | 43.1 | 43.2 | 43.4 | 28 |
| 29 | 43.5 | 43.7 | 43.8 | 44.0 | 44.1 | 44.3 | 44.4 | 44.6 | 44.7 | 44.9 | 29 |
| 30 | 45.0 | 45.2 | 45.3 | 45.5 | 45.6 | 45.8 | 45.9 | 46.1 | 46.2 | 46.4 | 30 |
| 31 | 46.5 | 46.7 | 46.8 | 47.0 | 47.1 | 47.3 | 47.4 | 47.6 | 47.7 | 47.9 | 31 |
| 32 | 48.0 | 48.2 | 48.3 | 48.5 | 48.6 | 48.8 | 48.9 | 49.1 | 49.2 | 49.4 | 32 |
| 33 | 49.5 | 49.7 | 49.8 | 50.0 | 50.1 | 50.3 | 50.4 | 50.6 | 50.7 | 50.9 | 33 |
| 34 | 51.0 | 51.2 | 51.3 | 51.5 | 51.6 | 51.8 | 51.9 | 52.1 | 52.2 | 52.4 | 34 |
| 35 | 52.5 | 52.7 | 52.8 | 53.0 | 53.1 | 53.3 | 53.4 | 53.6 | 53.7 | 53.9 | 35 |
| 36 | 54.0 | 54.2 | 54.3 | 54.5 | 54.6 | 54.8 | 54.9 | 55.1 | 55.2 | 55.4 | 36 |
| 37 | 55.5 | 55.7 | 55.8 | 56.0 | 56.1 | 56.3 | 56.4 | 56.6 | 56.7 | 56.9 | 37 |
| 38 | 57.0 | 57.2 | 57.3 | 57.5 | 57.6 | 57.8 | 57.9 | 58.1 | 58.2 | 58.4 | 38 |
| 39 | 58.5 | 58.7 | 58.8 | 59.0 | 59.1 | 59.3 | 59.4 | 59.6 | 59.7 | 59.9 | 39 |
| 40 | 60.0 | 60.2 | 60.3 | 60.5 | 60.6 | 60.8 | 60.9 | 61.1 | 61.2 | 61.4 | 40 |

KEUFFEL & ESSER CO., N. Y.

For Curve Tables see end of book

Cole Co.
1950 - 1 C

can pepper
2 pkg jello - orange
2 oranges

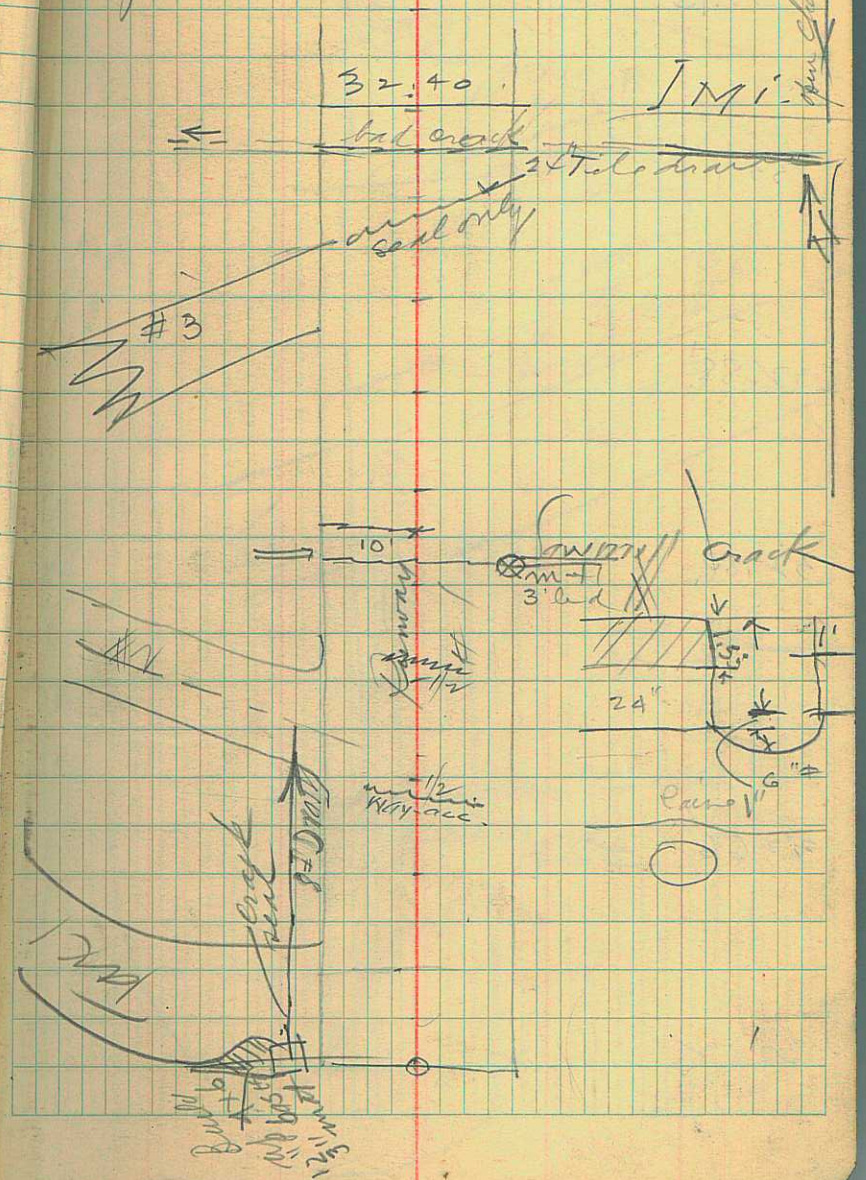
The paper in this book No. 360
is made of 100% high grade rag stock
with a WATER RESISTING surface sizing.

10
32.29
9 32.25
8
~~32.25~~
7
6
5 8.5
4 .65
3 31.55
3 31.55
2
1
0 31.3

For Curve Tables see end of ...

5-23-1950 3

Air Port - Survey of Cracks on runway



33.15

33.1

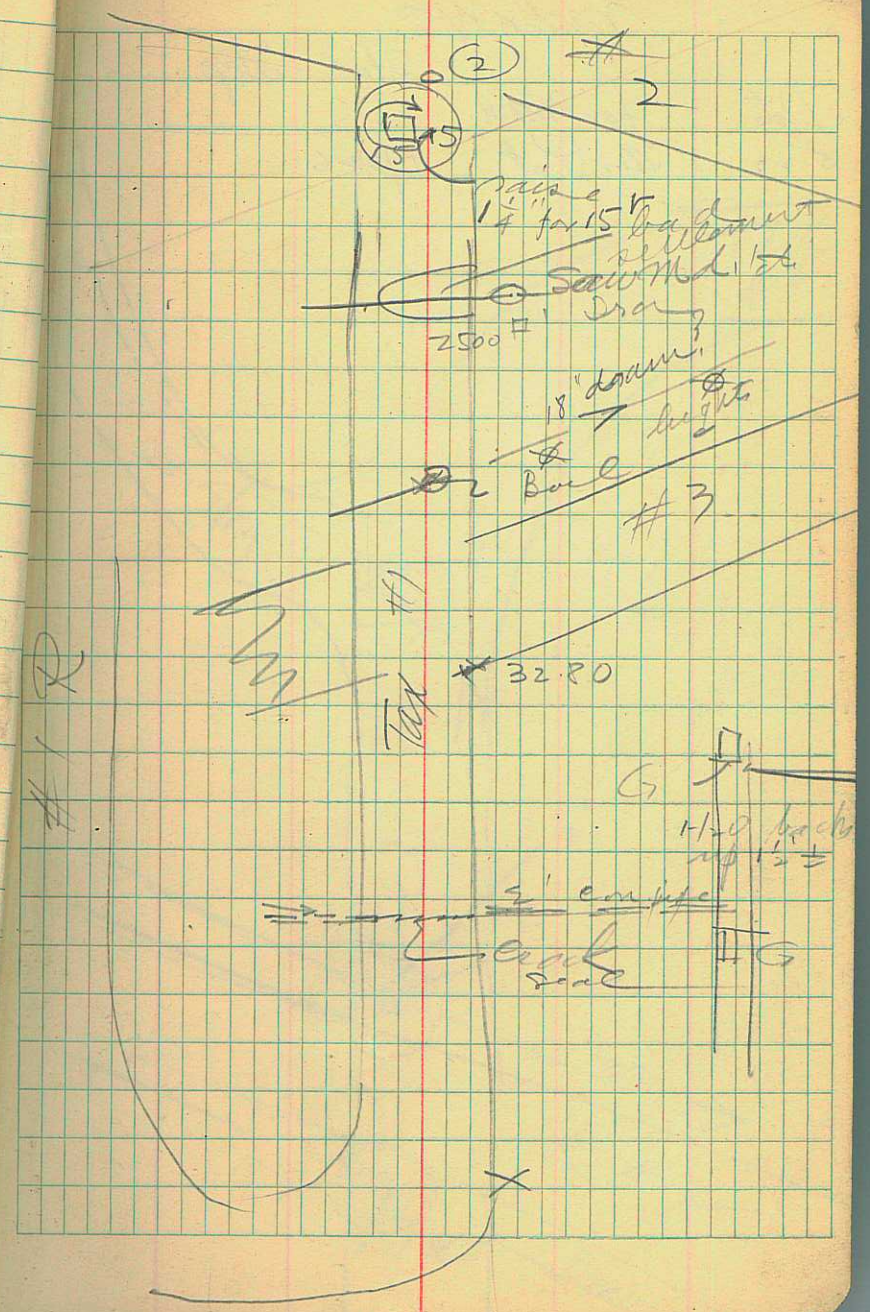
32.88

32.80

32.66

32.52



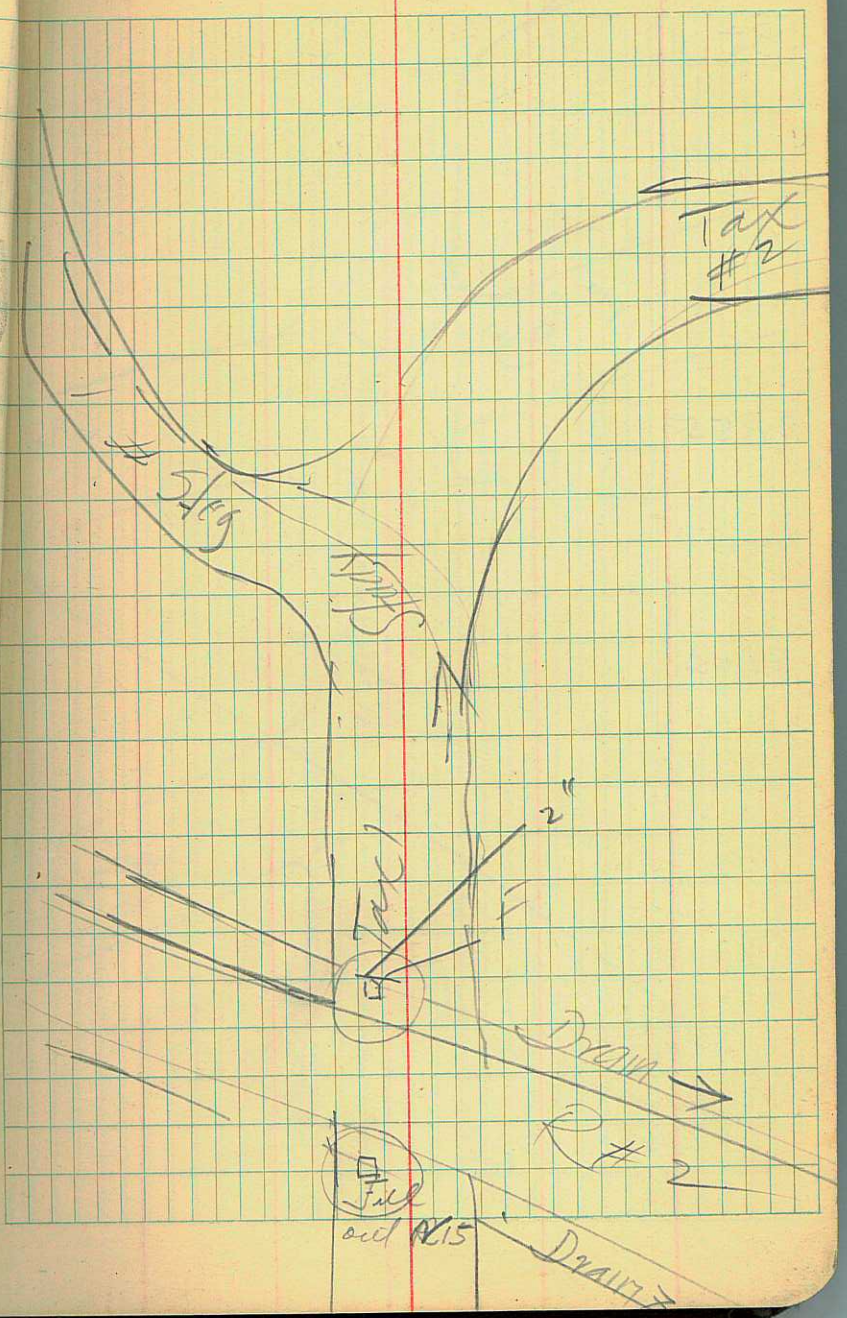


1950

Malaga

| Date | for Whom | Start | Stop |
|---|---|---|---|
| 5-23 | Air Port | 17226 | |





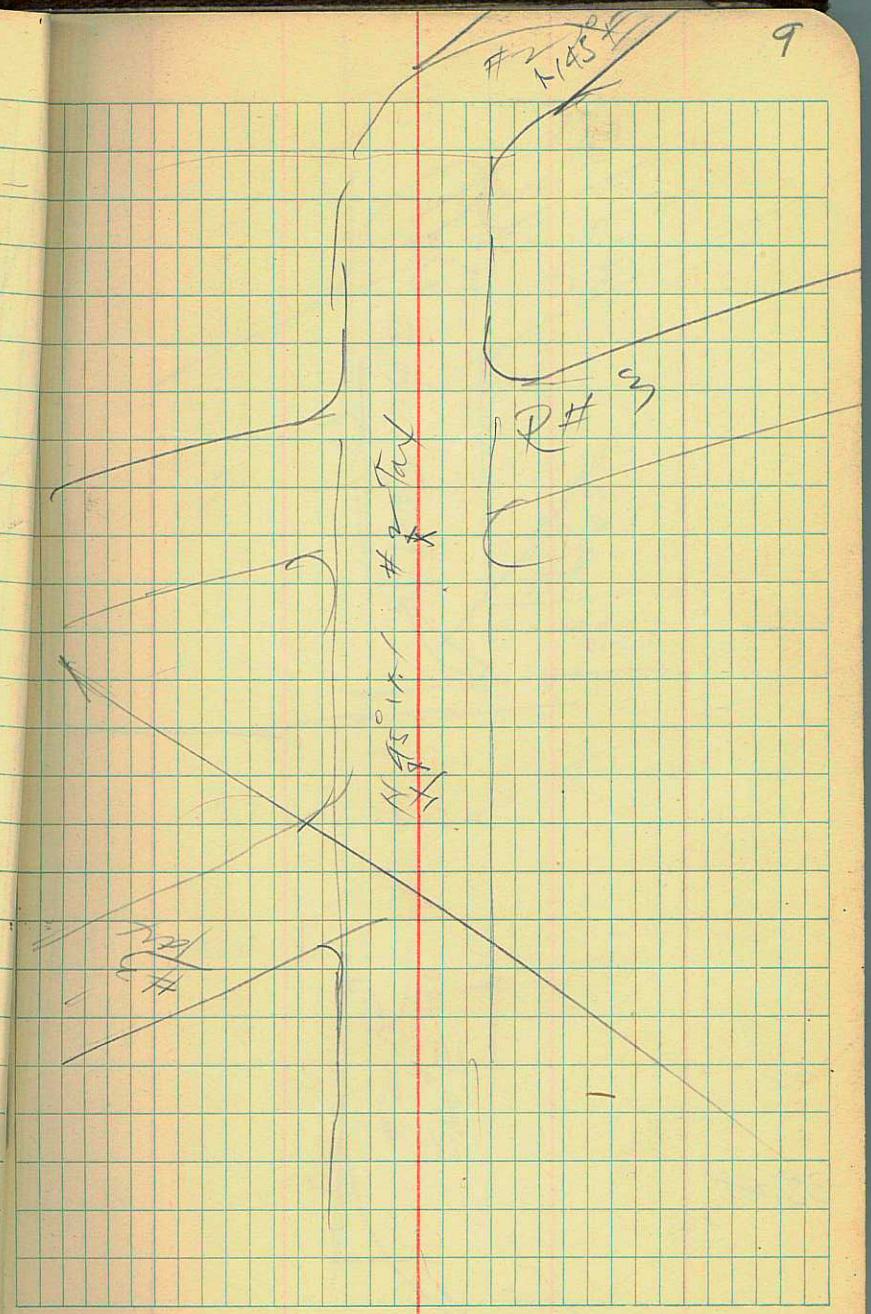
35.1

34.55

34.46

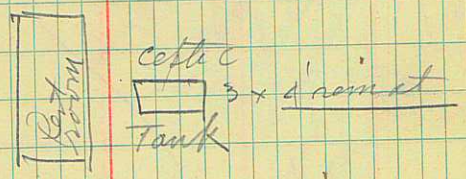
For Curve Tables see end of





35,2

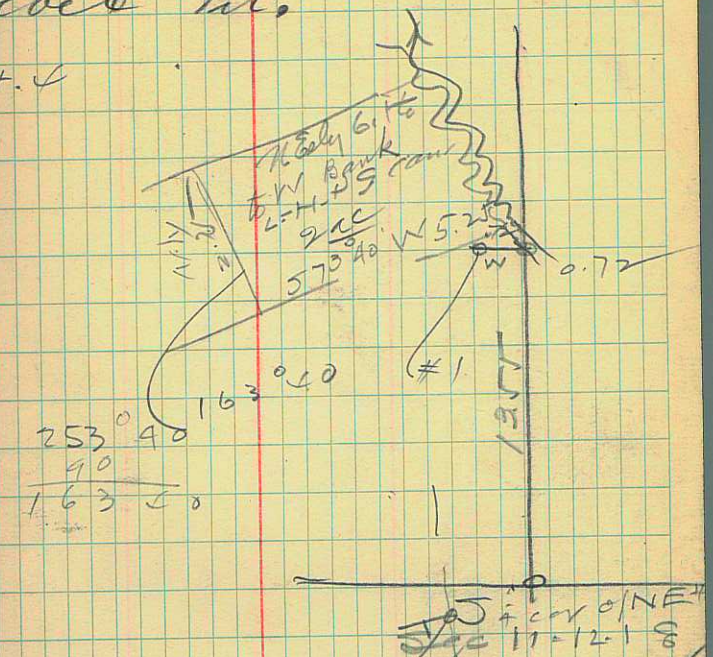
For Curve Tables see end of book


Septic
Tank
3 × 4' round

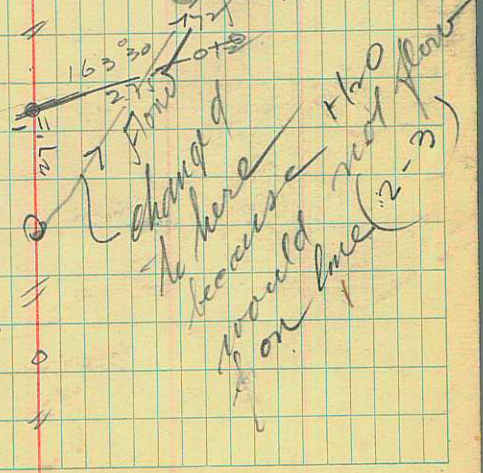
May 29 - 1950

Survey on Hyde Park Gravel Pit.

0 + .4




(out to old line)




∠ 163°40 2.87

3 163°40 2.75

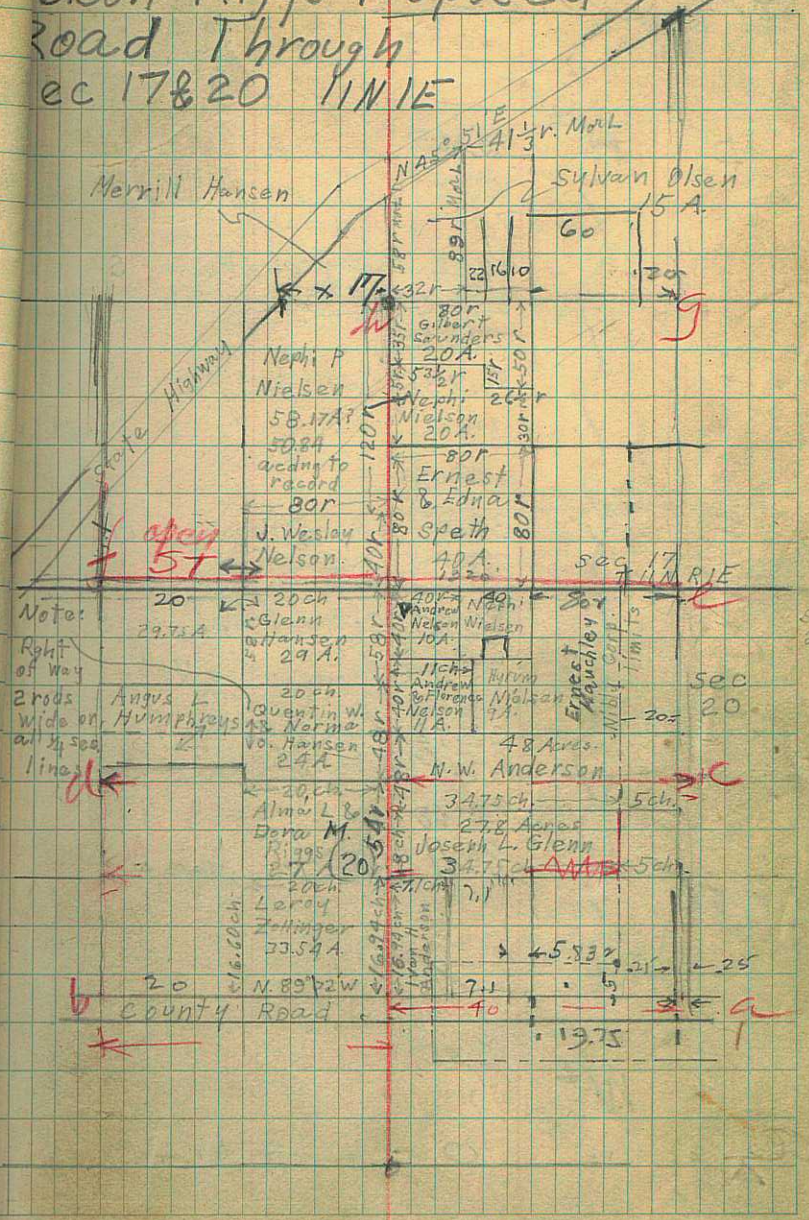
2 57°40' W 5.25

1

See sketch

For Curve Tables see

# elson-Riggs Proposed Road Through ec 17&20 1N 1E



Pl. Dir. Ch [E to W taite Lane]

b W±

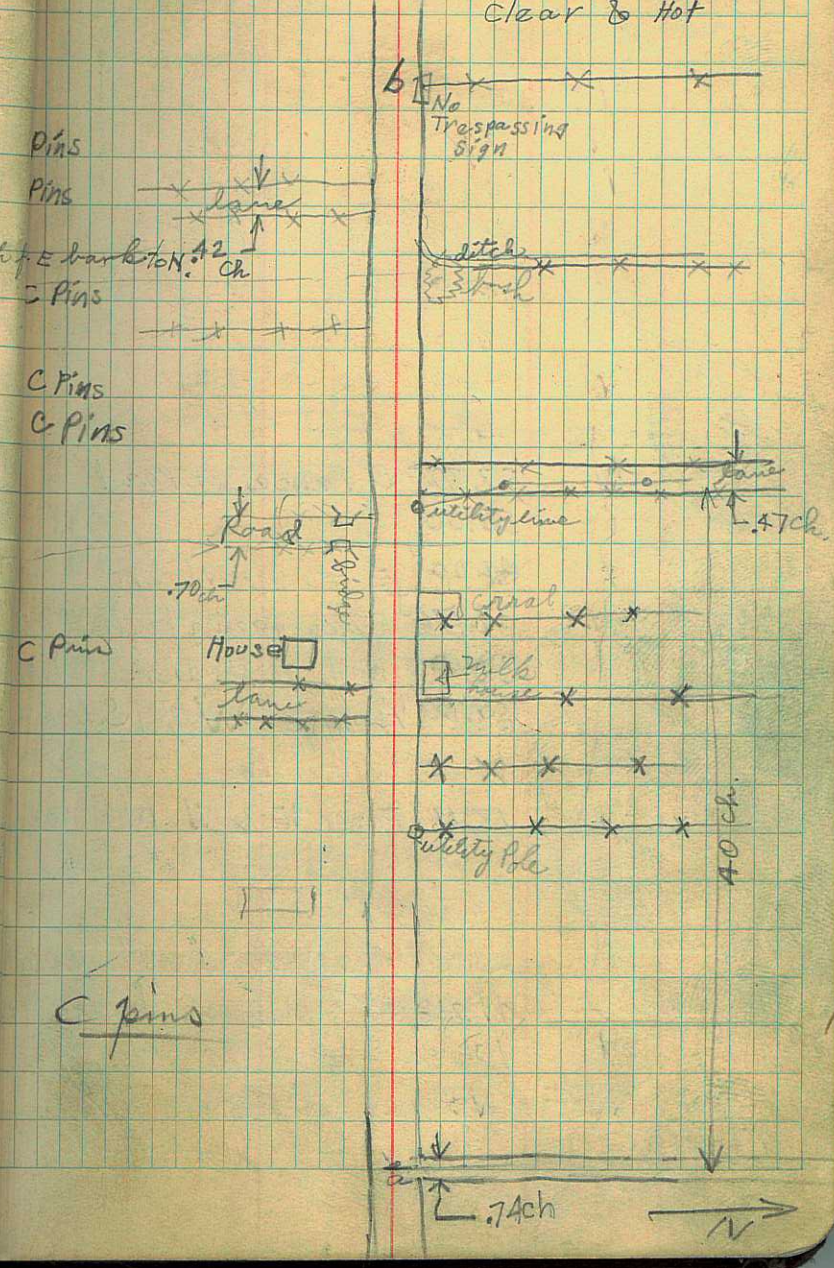
80.365
80.00
70.00
67.62 E fence of lane S
60.20± to bottom of ditch with ± E bank to N. .42 Ch
60.00
56.73 fence going S
50.00
40.00
39.97 E. fence of lane going N
36.80 E fence of road going S
32.94 fence going N
30.
25.92 fence going N
25.63 E fence of lane S
23.68 fence going N
20.11 fence going N
10.00

W±

a

O = ℄ of N.S. road

June 28, 1950 21
Hd Chuman: Clyde Linder
Rr. " : Earl Linder
Clear & Hot




For Curve Tables

Pl. Dir. Ch.

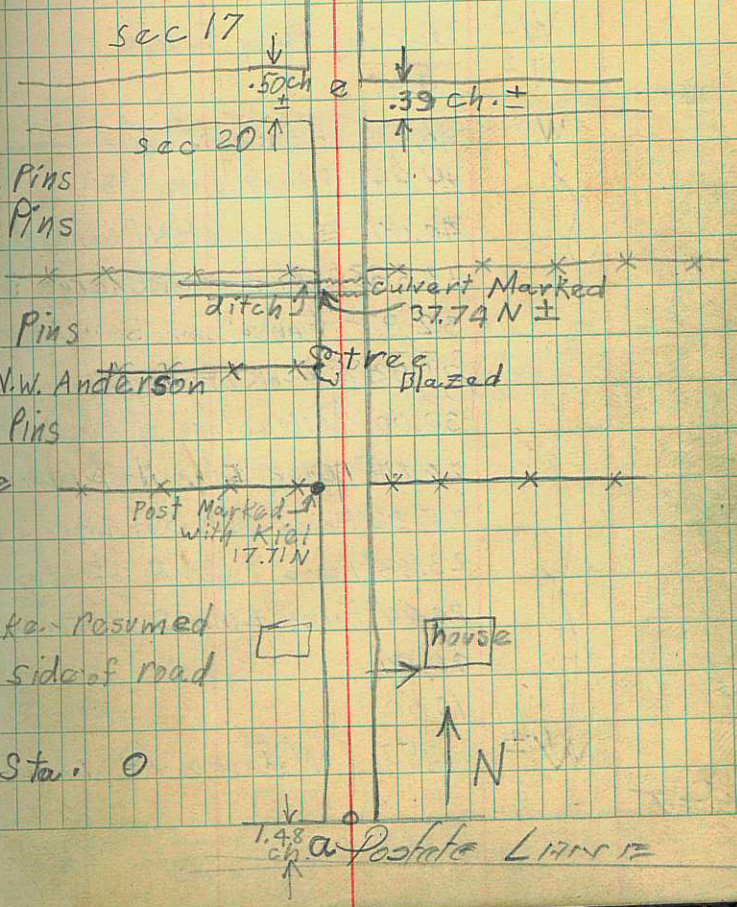
June 29, 1950

Ld: Clyde Linder
Rr: Earl Linder
clear & Hot

a

N± 57.70± S Fence of road
50.00
40.00
37.76± Fence going both E & W
30.00 Nail in shoulder of rd C Pins
25.70 Fence W; S. line of N.W. Anderson
20.00
C Pins
17.71 Fence E & W Both oline
12.00 Put Nail in Temp. chainbroke resumed
11.213 to S side of house E side of road
10.00
N± N fence of Postate Lane = Sta. 0

a

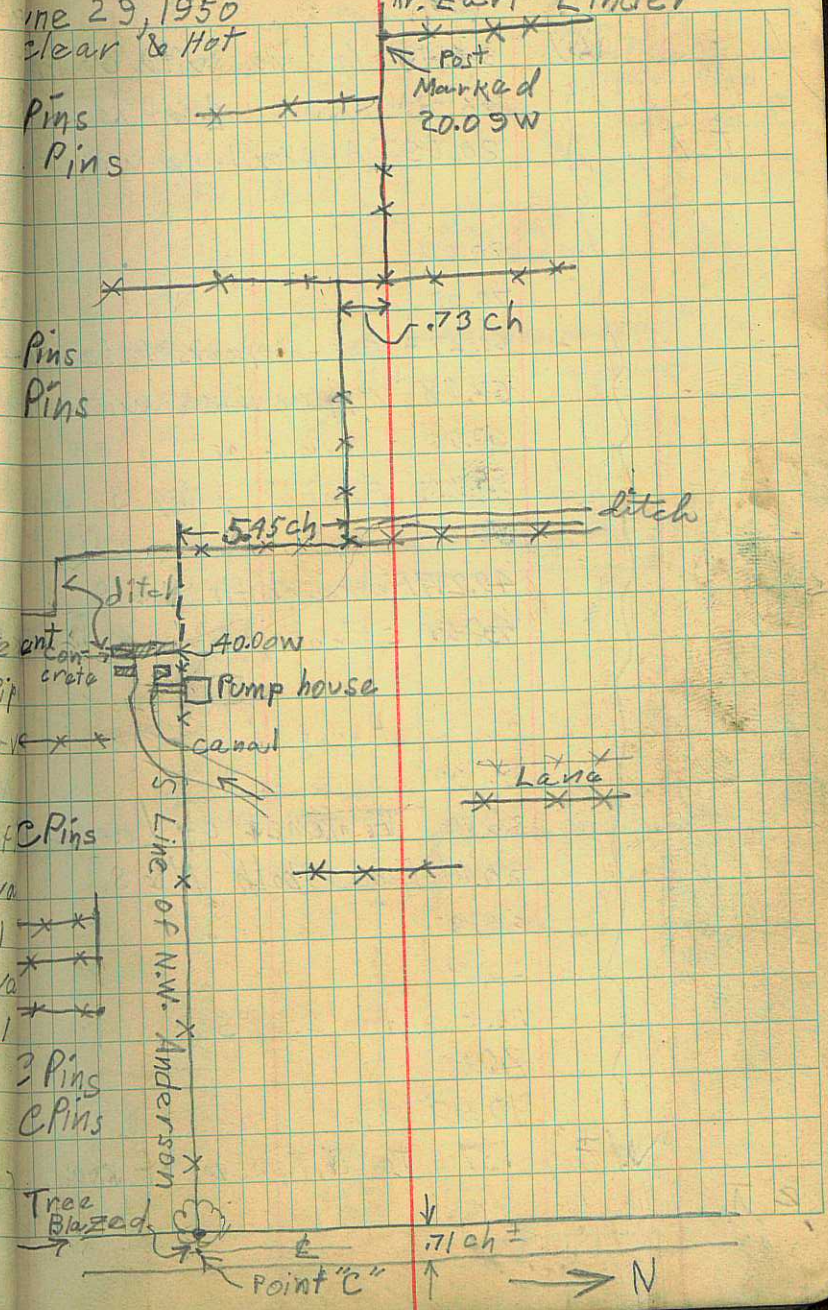


Ld: Clyde Linder 25
Br: Earl Linder

ne 29, 1950
Clear & Hot

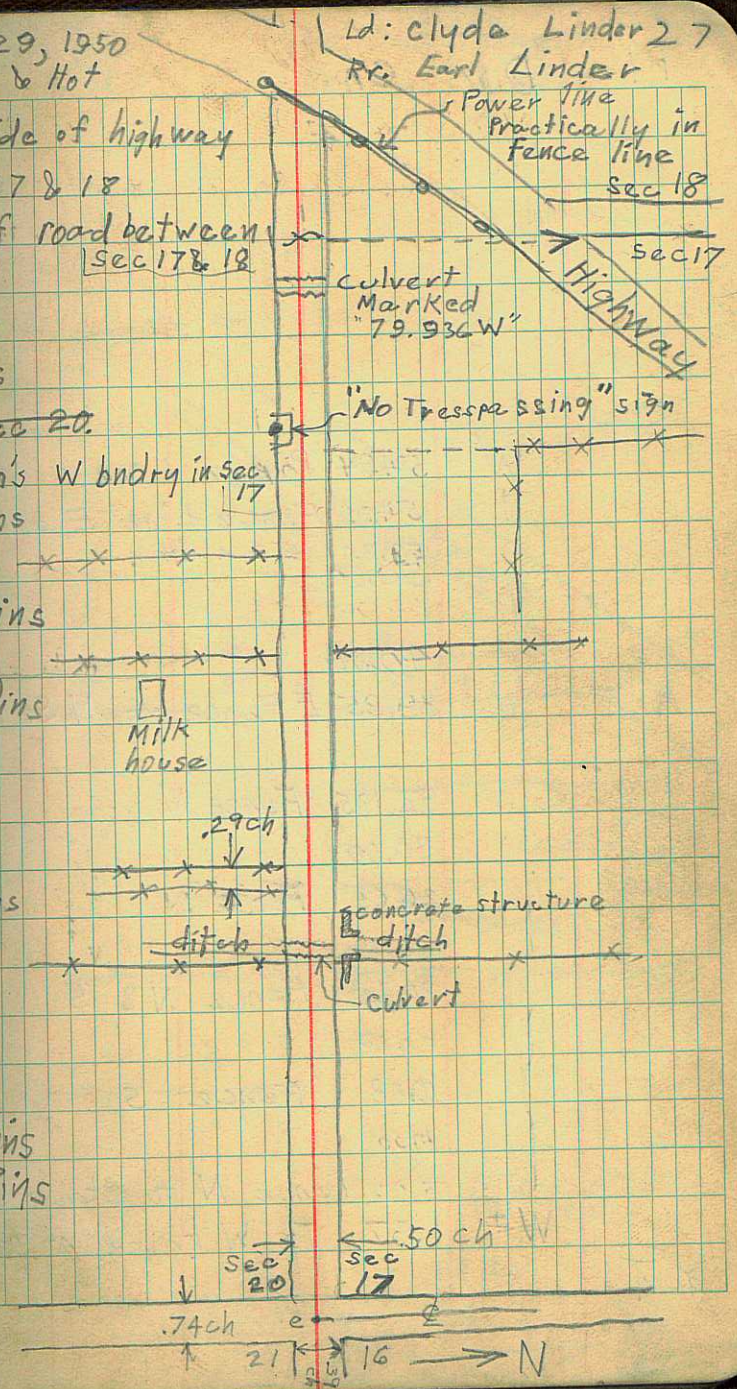
| Pl | Dir | Ch. | |
|---|---|---|---|
| d π | W± | 20.09 | Fence going N |
| | | 20.00 | |
| | | 16.95 | Fence going S. |
| | | 10.00 | |
| | W± | | starting from fence |
| | N± | 0.73 | |
| | W± | 20.10 | Fence N. & S. |
| | | 20.00 | |
| | | 10.00 | |
| | W± | | starting from fence |
| | N± | 5.45 | |
| | W± | 40.16± | Fence N & S |
| | | 40.07 | Power Line S |
| | | 40.00 | E edge of W concrete ant |
| | | 39.88± | of Pump discharge Pip |
| | | 32.93± | Fence Line S of interv |
| | | 31.92 | E bank of canal |
| | | 30.00 | Approx. Line of Fence N of |
| | | 29.24± | Fence Line N of interva |
| | | 25.92± | Fence Line S of interval |
| | | 23.68± | Fence Line S of interva |
| | | 20.09± | Fence Line S of interval |
| | | 20.00 | |
| | | 10.00 | |
| | W± | .355 | W Fence of road |
| C π | | | |

Pins
Pins
Pins
Pins
Pins
Pins
C Pins
3 Pins
C Pins




For Curve Tables see

| Pl | Dir | Ch. | |
|---|---|---|---|
| | W | | ne 29, 1950<br>ear & Hot |
| | | 84.42± | in Line with utili E side of highway |
| f ⊼ | | 80.35± | Approx ℄ of road in 17 & 18 |
| | | 80.09± | Approx Line with ℄ of road between Sec 17 & 18 |
| | | 80.00 | Pins |
| | | 70.00 | Pins |
| | | 60.27± | Post - ~~Appears to be in Sec 20.~~ |
| | | 60.08± | Approx Line with Olsen's W bndry in Sec 17 |
| | | 60.00 | C Pins |
| | | 54.37 | Fence going S shtist. |
| | | 50.00 | C Pins |
| | | 40.21 | Fence both N & S |
| | | 40.00 | C Pins |
| | | 30.00 | E fence of Lane C Pins |
| | | 20.10 | Fence both N & S. |
| | | 20.00 | C Pins |
| | | 10.00 | C Pins |
| | W± | .37 | to W Fence of road |
| e ⊼ | | | |



Pl Dir. Ch.

ne 30, 1950
lear & Hot

Hd: Clyde Linder
Rr: Earl Linder

W

5404 Power Line
54.01 Fence Line E of Hig
53.75 E bnk ditch
50.00

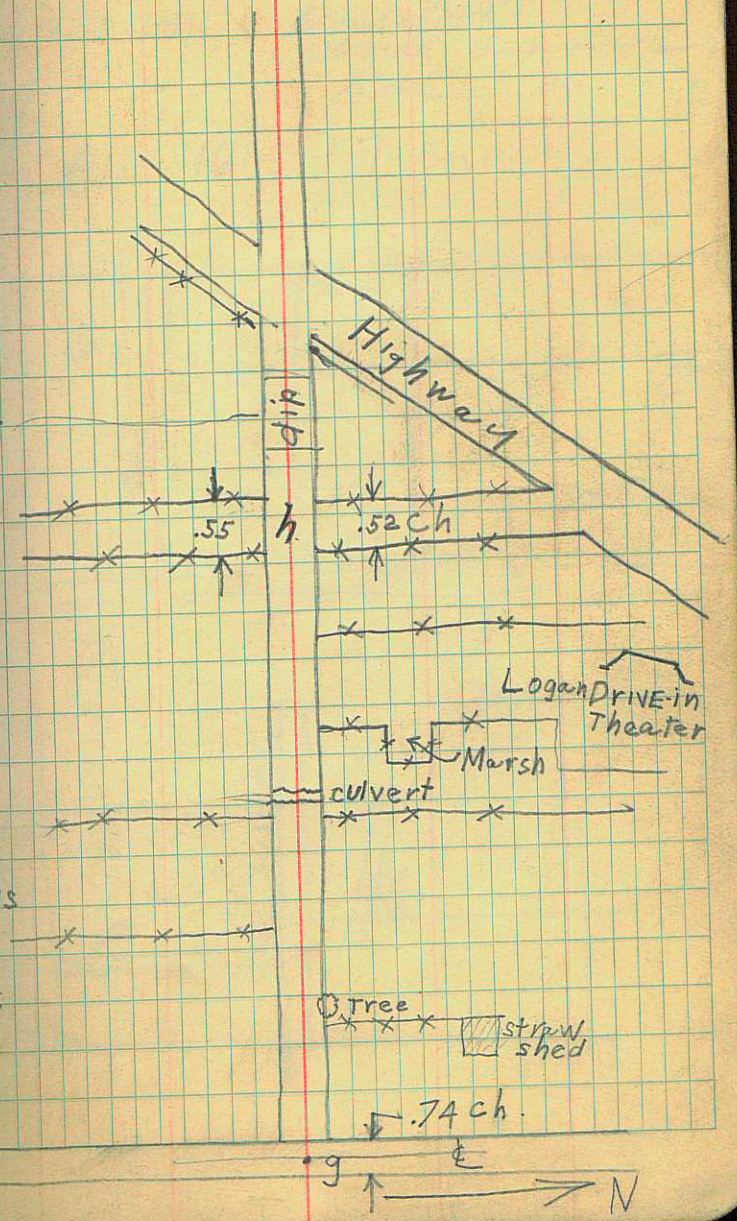
40.00
39.95 E Fence of N.S. Roa

h π

32.185 Fence N.
30.00
26.63 Fence N

20.14± Fence N & S
20.00
10.08 Fence S
10.00
5.27 Fence N to straw shed
W± .37 to W Fence of Road

g π

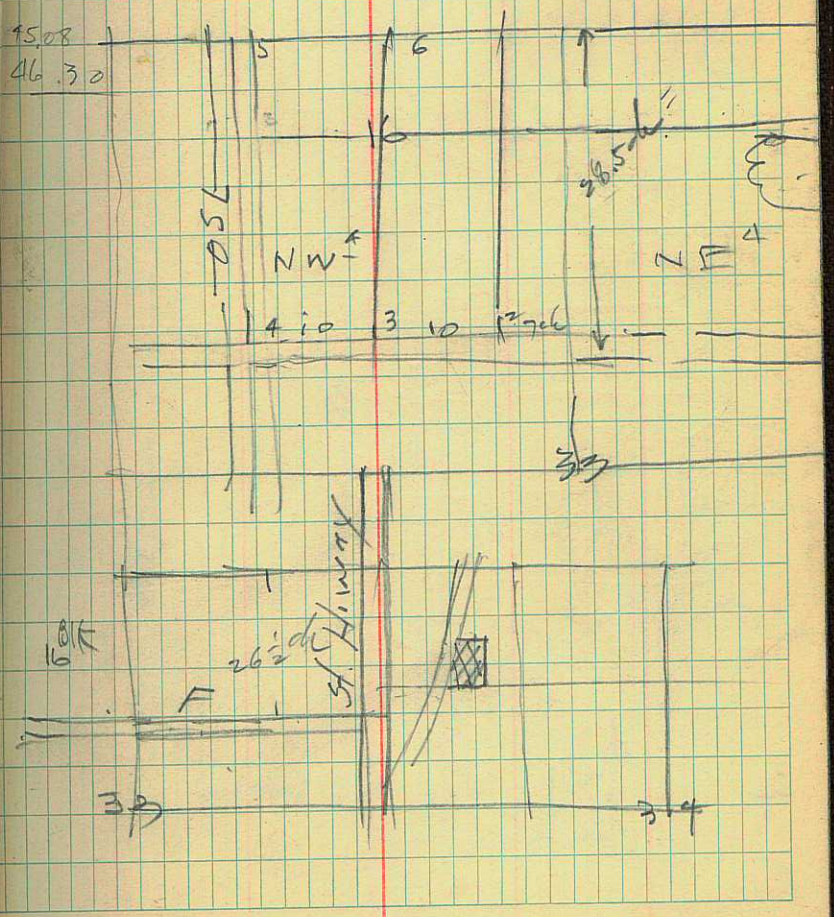


01 339. Mileage



Study - of Hy. North
field book 7-25-1950
9:30 am assistants
Clyde Linder
Earl "

℄ BLK 16 - 17 m



| Sta | L | R |
|---|---|---|
| | | |

3



July 31 - 1950

Study of Road align for Oil & Motion on 8 — by Linder

pins or stakes top Equal 1 4 degrees 10½ on each side of ℄

33
16
1
3
18
16

180°

30
25 3

25 — 25

Baesgen

Swine farm

23°55'

Godman 3 — 24.8 — 29.5

35°20'

# The Campaurvey

| Sta Grade | BS | FS | MM | Dist + or − | L | Rf. Grade | + Sections |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | -7.6 | | -6.1 | 70 | F 11'-0" | |
| 2 | 1.5 | | | | | | |
| | | 4.2 | | +6.3 | | 65 C 1'-4" | |
| | -10.5 | | | | | | |
| 2 | +5. | | | | | | |
| | | 6.5 | | -4.5 | 68 | +8'.4" | |
| 1 | 2. | | | | | | |
| | | 0.5 | | 11.5 | | 66 C 7'-9" | |
| | +3.8 | 12.00 | | | | | |
| 1 | | | | | | | |
| 0 | | -7.8 | | -6.3 | 68 | F 6'-4" | |
| 0 | 1.5 | | | | | | |
| | | 3.8 | | +9.7 | | 70 C 9'-9" | |
| | +13.50 | | | | | | |
| #2 | | | 1.10 | | | | |
| 0 | 0 +4.88 | | | | | | |

+2 − (−6.1) 10.5 / 9.1

+3.8 − (−4.5) 3.8 / 8.3

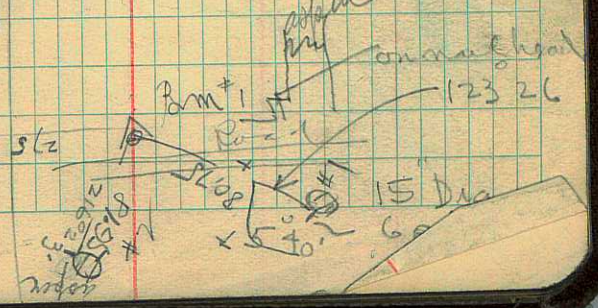
− (+6.3) 13.50 / 8.3

+3.8 − (+11.5) 3.8 / 7.7

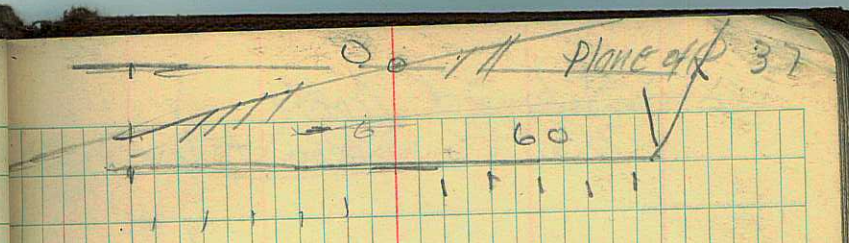
+2 − (+1.23) 10.5 / 1.2 / 2 / 3.3

+2 − (+6.3) 7.8 / 6.5 / 3

13.50 / 3.8 / 9.7



| Sta | F | C | New |
|---|---|---|---|
| 0 | 0 | | |
| 1+00 | +3.8 | | |
| 2 | +5.0 | | |
| 3 | +2 | | |
| 3+50 | | -4.2 | |
| 4 | | ~~7.5~~ 7 | 7.00 |
| 4+50 | | ~~4.0~~ | 2.70 |
| 5 | +6.5 | | |
| 5+50 | +15.5 | | |
| 6 | +5 | | |




$$-6 - (-6)$$

$$\pm \text{Corr} - (\pm D) = \text{eq.}$$

(+6)

Wheel levels

| | BS | FS | Grd Elev | Elev | HI | Cor | |
|---|---|---|---|---|---|---|---|
| 4+50 | | 1.30 | 70.00 G | 72.70 | | | 2.7 |
| | 8.00 | 4.40 | | 66.00 | 74.00 | | |
| 4.00 | 14.00 | | | | 70.40 | | |
| 4+00 | | 0.3 | 49.00 | 56.4 | | | C7.4 make it 7' |
| 3+50 | 13.7 | | | 43.00 | 56.7 | | |

Computation

Levels

43.3
13.7
56.4
14
70.4

| Sta | Gd. | BS | FS | VM | Dist per + or − | Ld |
|---|---|---|---|---|---|---|
| | | | 8 | | −5.4 | 57 |
| | | 2.60 | | | | |
| | | | 5.2 | | +4.9 | |
| 5 +00 | +6.5 | 10.1 | | | | |
| | | | 4.4 | | +1.6 | 64 |
| 4 50 | | 6.00 | | | | |
| | | | 4.5 | | 9.5 | |
| 4 50 | −2.7 | +14 | | | | |
| | | | 5.2 | | +4.3 | 71 |
| 4 | | +9.5 | | | | |
| | | | 5.2 | | +9.3 | |
| 4 00 | −7 | +14.5 | | | | |
| 3 +00 | −4.2 | 5.2 | 5. | | | 64 |
| | | | 1.0 | | +8.5 | |
| 3 +50 | −4.2 | +9.5 | | | | |
| | | | 6.00 | | −.8 | 63 |
| 3 | | 5.2 | | | | |
| | | | 2.9 | | +5 | |
| 3 | +2 | +8 | | | | |

Rf | Cor F

F 12

47 Gd.

C 4 − 4

72 C 12 3"

C 11 − 4

77 C 16 − 4"

C 4 − 5"

70. (or C 12 1")

F 2 − 0"

64 C 3 − 1"

+6.5 − (−5.6)

+6.5 − (−5.4)

10 1 / 12

5.2

+6.5 − (+4.9)

6.9

1.6 +

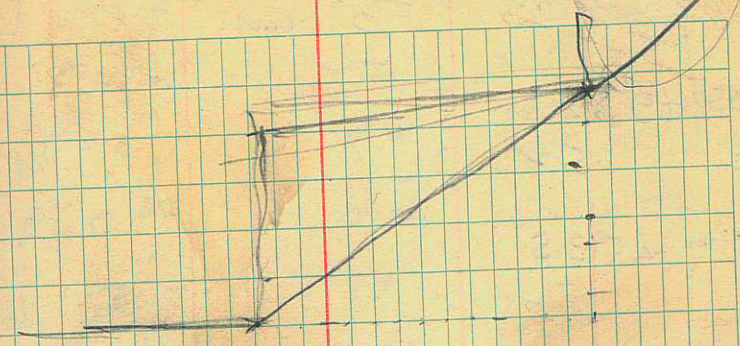
7.2

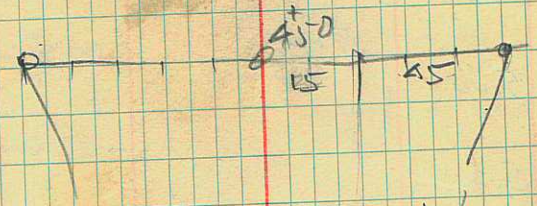
4.6

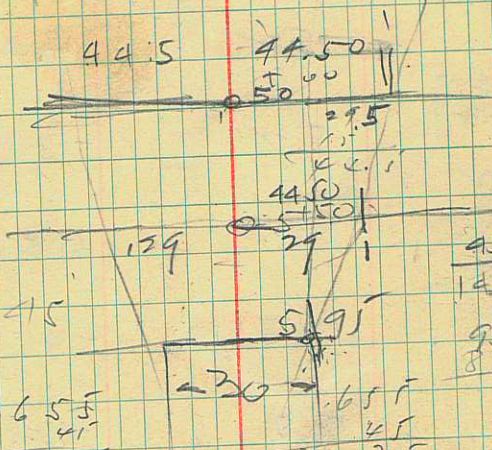
6.5

−4 − +8.5

−9.2 − (+.2)






$450 \times 31 = 1450$

$1450 \div 31 = 45$

$45 \times 31 = 1395$

$1395 \div 31 = 45$

$45 \times 31 = 1395$

| Grade | BS | FS | um | Raise + or - | L |
|---|---|---|---|---|---|
| | | 5.2 | | -1. | |
| +50 +9' | 4.2 | 4.7 | | | 18 |
| | 5.2 | | | | 18 |
| | | 5.2 | | -1.7 | |
| 8+00 +4.5 | 3.5 | | | | |
| | 5.2 | 4.7 | | +.5 | 16 |
| | | 5.2 | | -.4 | |
| +50 +0.5 | 4.8 | 6 | | | |
| | 5.2 | 6 | | -0.8 | 20 |
| | | 5.2 | | -0.2 | |
| 7 -3' | 5.00 | | | | |
| | | 8 | | -2.8 | 20 |
| | 5.2 | | | | |
| | | 5.2 | | -.4 | |
| 6+50 -1' | 4.8 | | | | |
| | | 5.2 | | -3.2 | 30 |
| | 2 | | | | |
| | | 5.2 | | +1.8 | |
| 5+95 +13.2 | 7.00 | | | | |
| | | 10.8 | | -7.5 | 50 |
| | 3.30 | | | | |
| | | 2.8 | | +5.5 | |
| 5+50 +15.5 | 8.00 | | | | |

| ℓ' | Cor |
|---|---|
| | F |
| 25 | F10' |
| | F4 |
| 22 | F6'2" |
| | G |
| 18' | F1' |
| | C2-2" |
| 20 | -2-10" |
| | F1-10 |
| 16' | C0.5 |
| | F6-5" |
| 30 | F11.5" |
| | F23 |
| 45 | F10 |

(-1) 4.5 45

6 3

+4.5 - (+.5) 4.5

+4.5 - (-1.7) 6.2

+5 - (+.5)

+5 - (-.4)

14" Pine
27+36 - 32 - (+13.2)

- (-2.8)

7.00
5.2
+1.8

3.2 13.8 16.0

10.8 3.3 7.5

8 2.8 5.2

15.1 3.3 3.0

10.2 .30

+15.1 - (+5.5)
5.2
4.7

15.5
15.1
.0

| Sta | Grade | BS | FS | HI | Raise + or − | L | R | Cor F |
|---|---|---|---|---|---|---|---|---|
| 9+50 Top | | | | | | | | |
| 8+50 | | | | | | | | |
| 7+50 | | | | | | | | |
| 7+00 | | | | | | | | |
| +50 | 0 | | | | | | | |
| | | | 4.2 | | +1 | 18 | | |
| | | 5.2 | | | | | | |
| | | | 5.2 | | −1.2 | | | |
| 9+00 | +6. | 4.6 ✓ | | | | | | |
| | | | 5 | | +0.2 | 24 | | |
| 8+50 | +9 | 5.2 | | | | | | |



7+00

247.8

225.8

198.4

183.4 C

Elevation at 7+50

Elevation 9+00

F5

23 7+00

F8 10

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Elev | | | | | | | |
| | | | Hm | | | | | | | |
| 6+50 | 5°40 | | | 4. | +14°41' | 11.1 | 171.3 | 658 | | |
| 6 | " | | | 5. | +14°15' | 11.5 | 153.6 | 616 | | |
| 5+95 | " | | | 5. | +14°13' | 11.4 | 148.7 | | | |
| 5+50 | 5°40 | | | 6 | +13°17' | 11.75 | 125.0 | 546 | | |
| 5+00 | 5°40 | | | 6.0 | +11°52' | 11.2 | 99.3 ? | | | vergence |
| 4+50 | 5°40 | | | 1.0 | +8°40' | 5.64 | 70.1 | | | worked ground |
| 4+00 | 5°40 | | | 1.0 | +7°45' | 5.08 | 56.5 | | | on worked ground |
| 3+50 | 5°40 | | | 2. | +6°31' | 5.55 | 40.7 | | | |
| 3+00 | 5°40 | | | 2 | +5°50' | 5.06 | 32.31 | | | |
| 2+00 | 5°40 | | | 3.00 | +4°43' | 5.02 | 17.30 | | | |
| 1+00 | 5°40 | | 10 | 2.5 | +3°16' | 3.5 | 7.55 | | | |
| 275+21 | | | | | | | | | | |
| Pom #1 | | | 116 | | | | 3.74 | | | |
| 0 | | 430 | | | | | 0 | | | |

973
973
2919
6811
6557
9476
95
5.75
4
2875
5775
5476

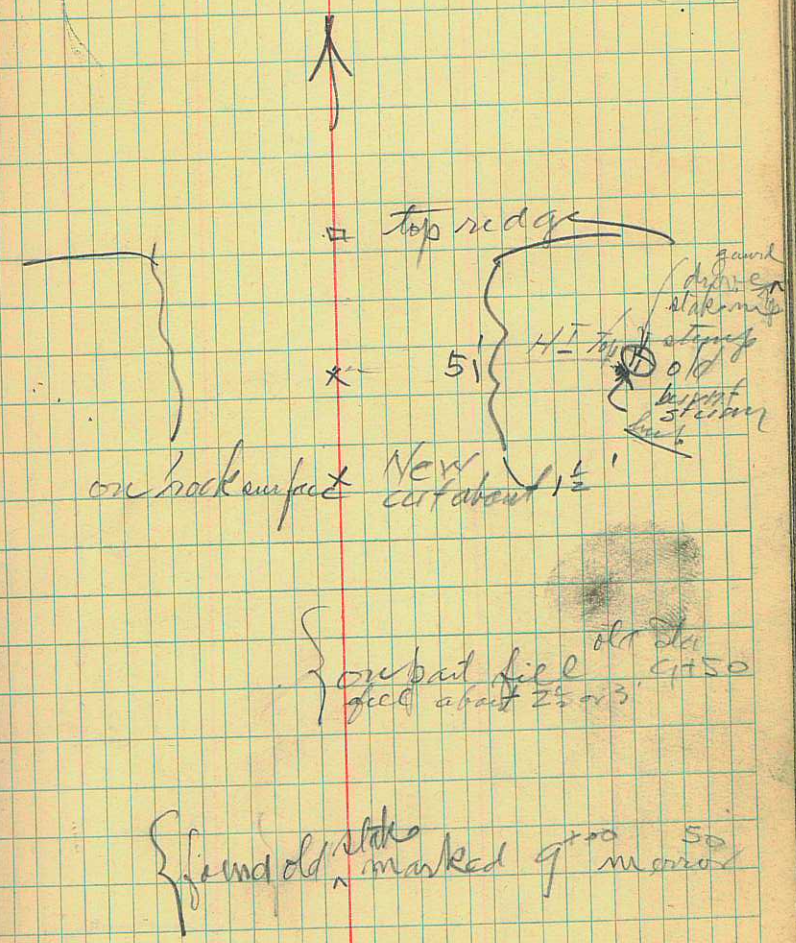
Pom 1 to 2 mi distance
(Pm #1 ?) meas
Alt = 104.90

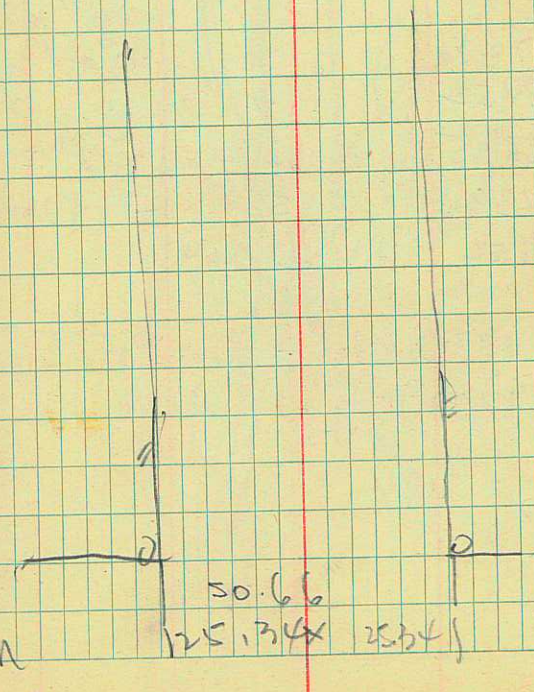
| | BS | FS | HI | Elev | Hor | Vert |
|---|---|---|---|---|---|---|
| recover | | | | | | |
| 9+00 ℄ | 11.35 | 1.04 | 262.92 | 251.57 | | |
| | | 8.00 | | 244.6 | stake new | |
| | 11.42 | 0.84 | 252.61 | 241.19 | | |
| 8+50 ℄ | 10.90 | 0.92 | 242.03 | 231.13 | | |
| | | 2.80 | | 229.3 | by old stake properly | |
| 8+00 ℄ | 11.24 | 1.07 | 232.05 | 220.81 | | |
| | | 5.70 | | 216.2 | could not find ℄ old stake | |
| 7+50 ℄ | 11.32 | 0.32 | 221.88 | 210.56 | | |
| | | 8.40 | | 202.5 | | |
| 7+36 ℄ | 12.03 | 0.52 | 210.88 | 198.85 | | |
| | | 1.4 | | 198.0 | against face of | 14" pine 7+36 ℄ old stake |
| 7+12 | | 11.64 | | 187.7 | | |
| 7+00 | | 11.40 | | 188.0 | | Remove nail in root of 10" pine 18' L of ℄ |
| 7+ | 11.27 h | | 199.37 | | | |
| | | | | | | h offset W 3 |
| 7+00 as marked | 5 | 4.00 | +15° | 11.65 | 188.1 | 714 offset 3' W first below grade 189.00 |
| 7+00 marked | 5 40' | 4. | 14°55' +15° | 11.67 | 188.6 | |

| Sta | BS | FS | HI | Elev | HI |
|---|---|---|---|---|---|
| 11+00 | | 3.35 | | 279.59 | |
| Bm #3 +73 | | | 3.60 | 279.54 | |
| 10+50 | | | 7.50 | 275.6 | |
| 10+00 | | | 9.80 | 273.3 | |
| | 11.05 | 1.70 | | 272.09 | 283.14 |
| | 11.80 | 0.93 | | 261.99 | 273.79 |
| 9+50 New | | | 4.7 | 258.2 | |
| | | | | | 262.92 |



Ski jump.
Beaver School run



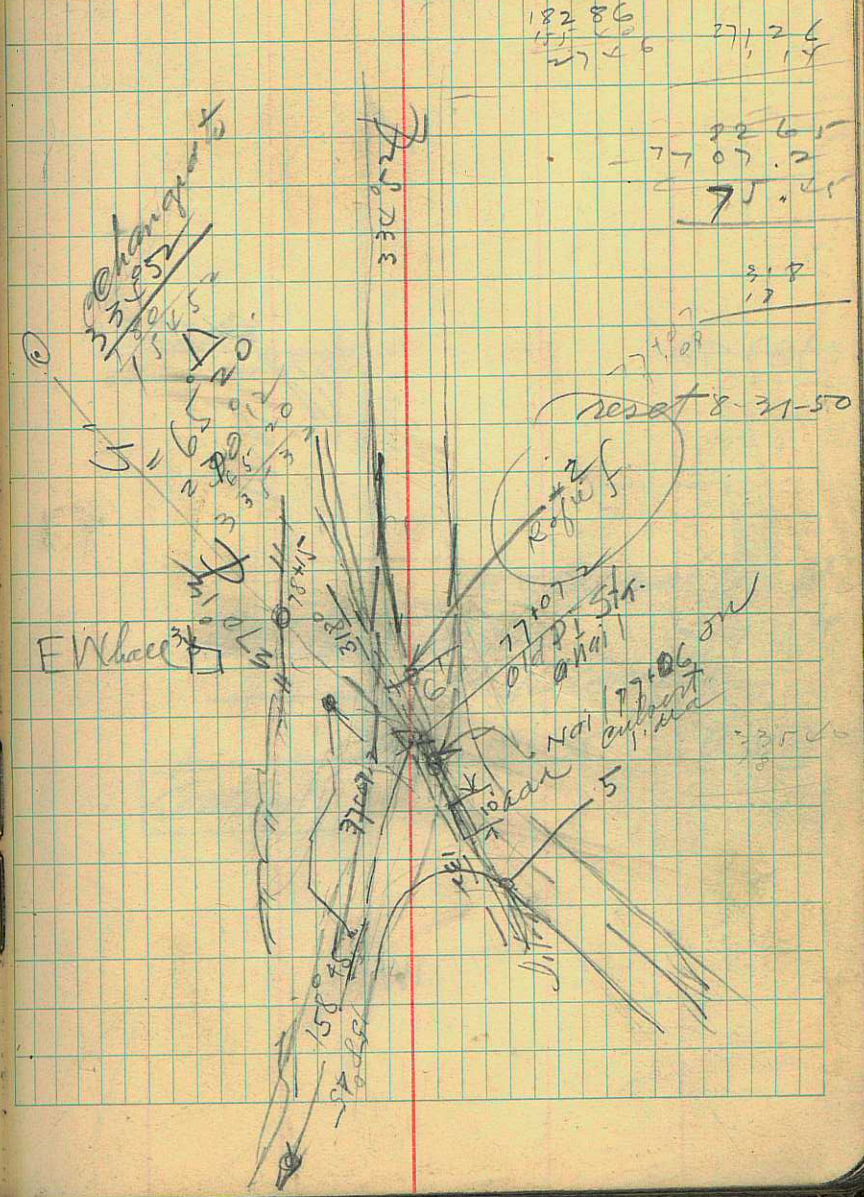

50.66
25.34
25.34
A E
180

(see over page 60)

| | | | | | |
|---|---|---|---|---|---|
| | 183°26 | forward ℄ over prop. Ed Wood | | | |
| | 335°40 | decide ℄ ℄ | | | |
| 77+07.2 | 155°40 | | | | |
| 5 | 74°30' | | 4 | -1°45' | 4.50 |
| 1 | 33°52 | | 2 | | 2.88 |
| | 158°45 | ℄ of proposed Rd 1300 | | | |
| 3 | 123°30 | | 5 | - | 5.43 |
| | 89°52 | Utit. Pole 1700± | | | |
| | 270°12 | 108 | f bears SE old road 6 side | | |
| +82.65 | 270°12 | 75.45 | should be nail | | |
| 77+07.2 | | | | | |

aug 15-1950 57

Study of Road on Providence Canyon road at So. Bankheads.



Survey for
20th Claypool 8 - 21-50

2
191.75
8.25

195.5
191.75
3.75

327.43

327.43
195.5
131.93

Bldg.

Lev

195.5 Claypool Beg pt.
193.35
191.75 Cent. desc.
191.35

Centinal

327.93

193.35
191.75
191.35

Force
Force
3.5
3.5
3.5

21+00

+38 1°45 stake to meas Earth from

+37

+27

+17

20+00

19+00

38.2

18

11°10' ← W side Smoke Stack

20°40' ⊙ → Eside do

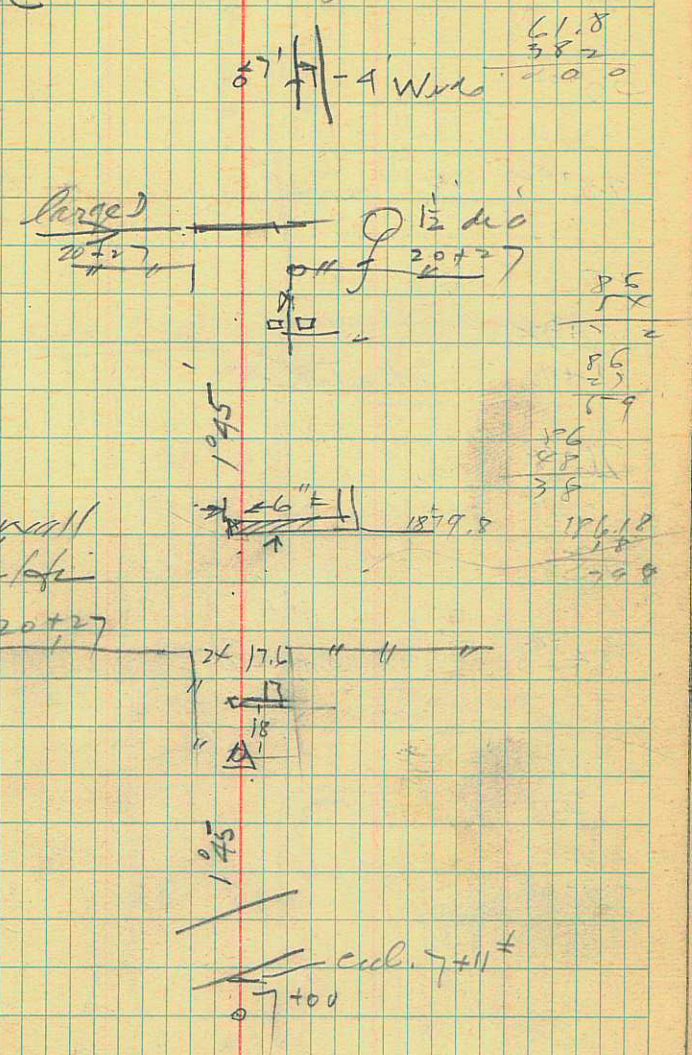
65°50' ℄ Coination Milk Stack

18+61.8



Sept 16-1950

Continuation of Al Rapp Road west of



32

31

30+00

28+00

27

+92

+90 at stake

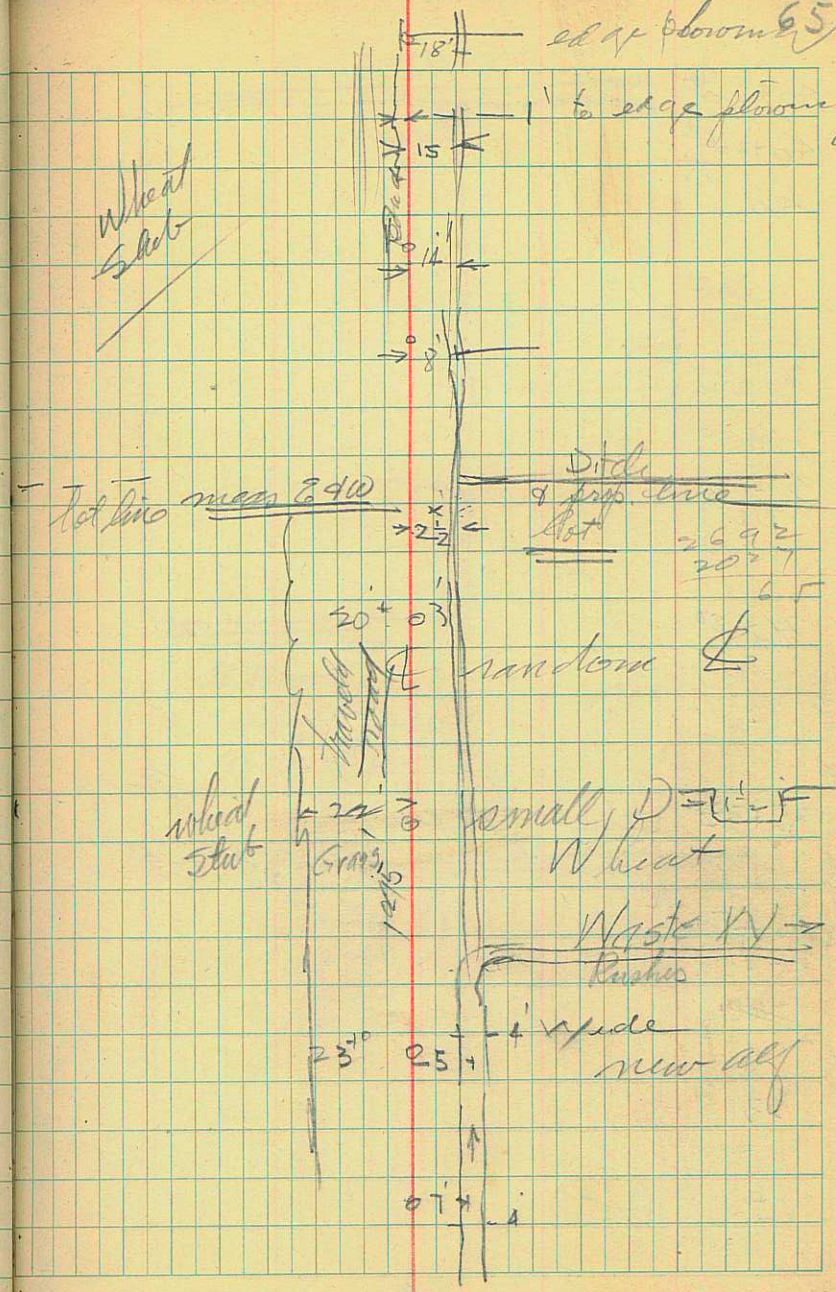
26+00

25

24+00

+58

23+00



40+30 th

40+25 th

40

39

38

37+00

36+80

33+59

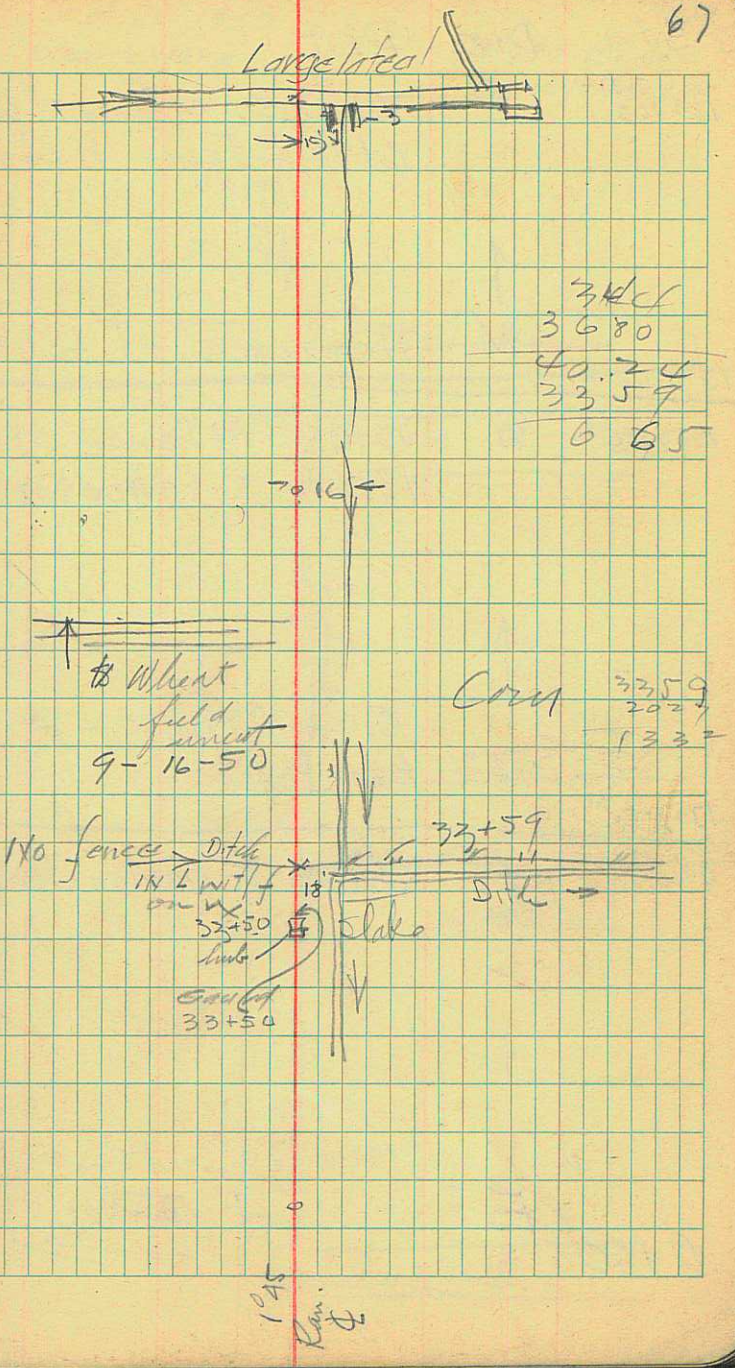
fence

+50 th

33

32+00 1°45

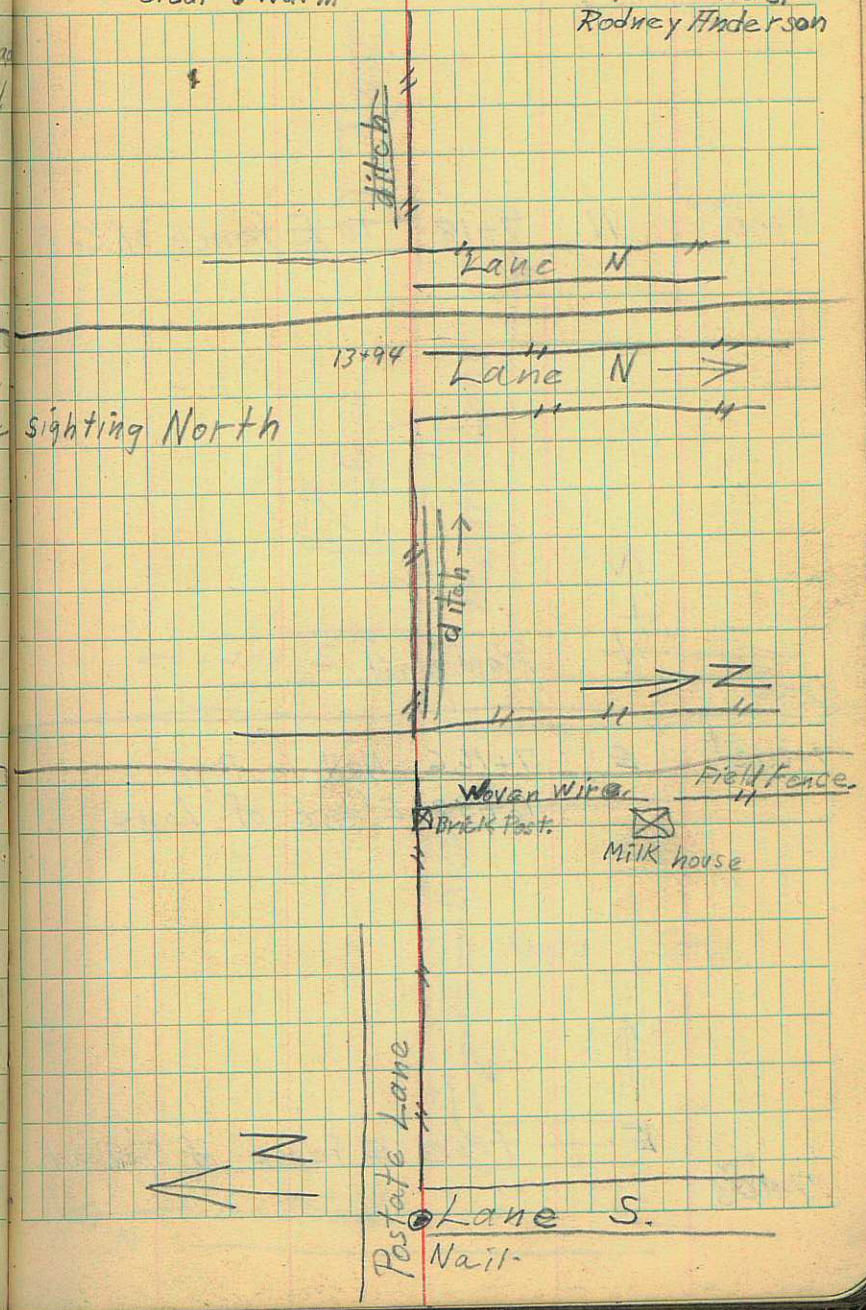




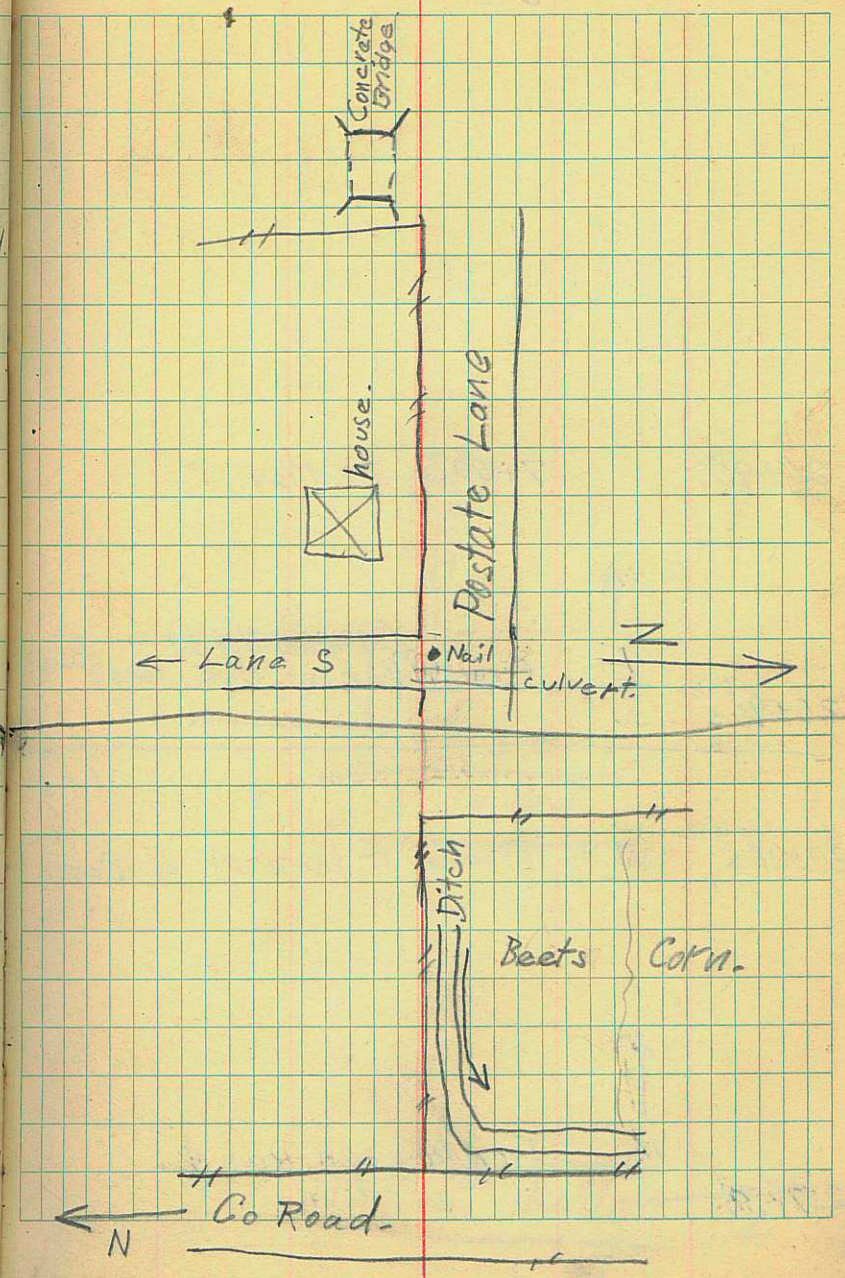
Sept 20, 1950
clear & warm

Clyde Linder
Rodney Anderson

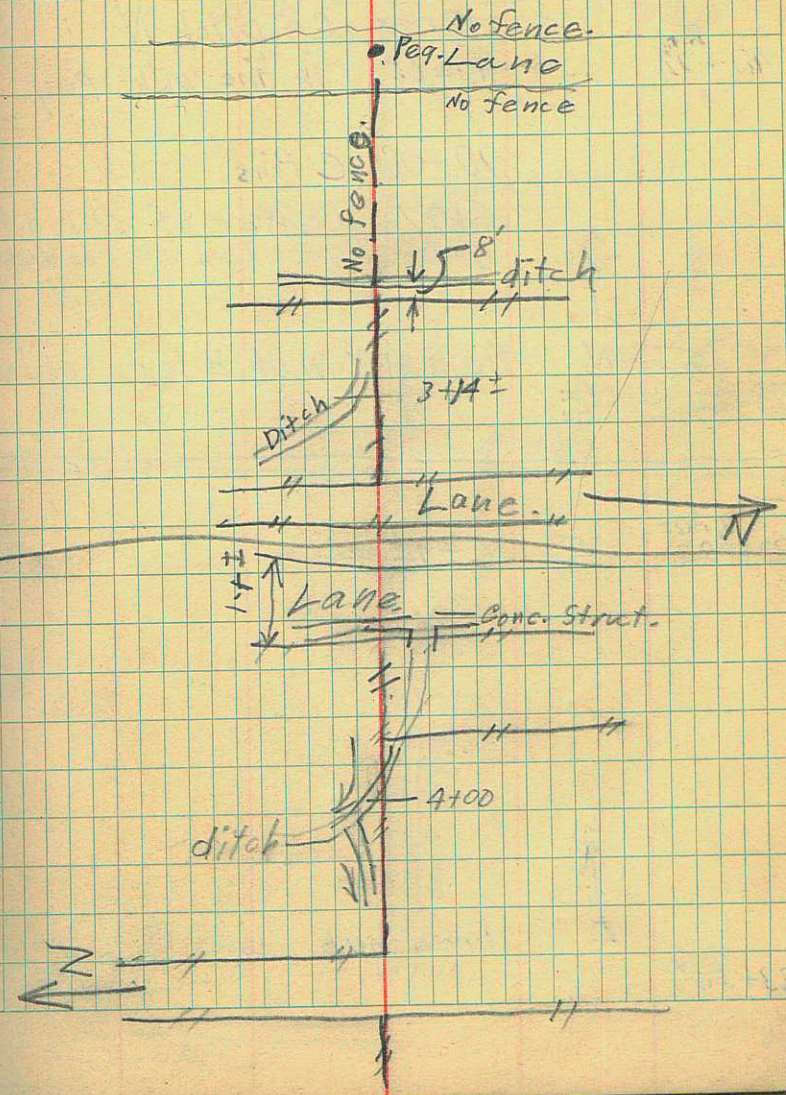
| Sta. | Dir. | Dist. |
|---|---|---|
| 7+33 W<br>13+76 S | W | 7+33.5 W fence of Co. Road<br>6+93 E fence of Co Road |
| | ↑ | |
| 13+76 S ± | W | from W fence of Lane. |
| 13+76 S ± | W | 13+94 W fence of Lane.<br>13+62 E fence of Lane sighting North |
| | ↑ | |
| 13+76 ± S ?E | W ± | 10+00 C Pins<br>from fence |
| 0+00 13+76 E | E | 13+76.0 to garden fence S |
| | ↑ | |
| 0+00 | E ± | 10+00 C Pins.<br>From Nail. |



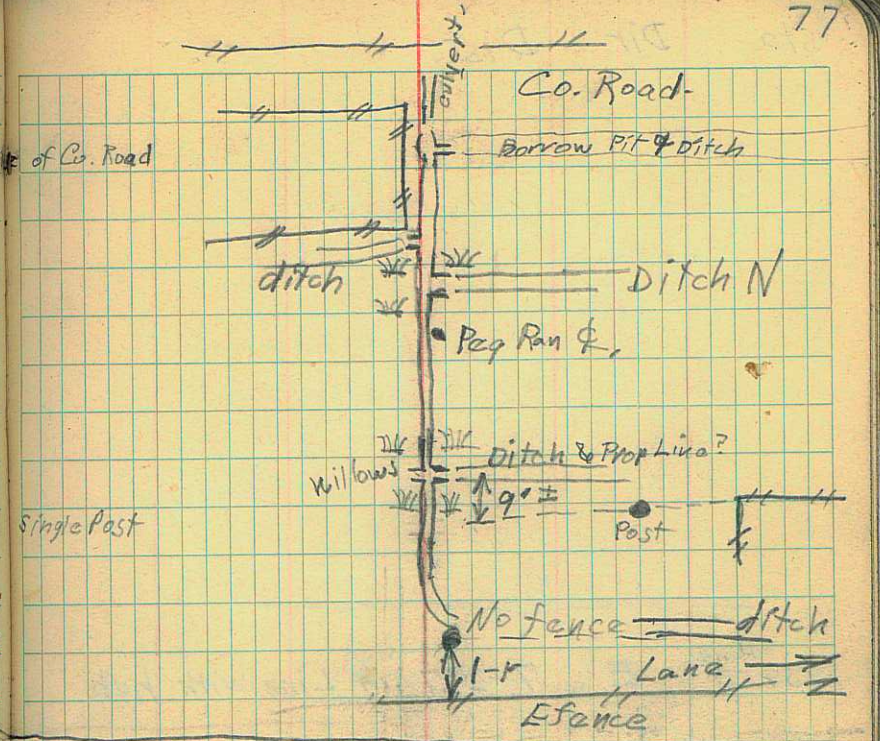
| Sta | Dir. | Dist. | |
|---|---|---|---|
| 0+00 7+18W | W. | 7+18 | To E fence of Co Rd. |
| 0+00 | ↑ W | from Nail | |
| 7+00S ℄ | E | 7+16.6 | Nail in Peg. |
| | | 6+98 | E fence of Lane |
| 7+00S ?W | ↑ E | From E fence of Co Road. | |



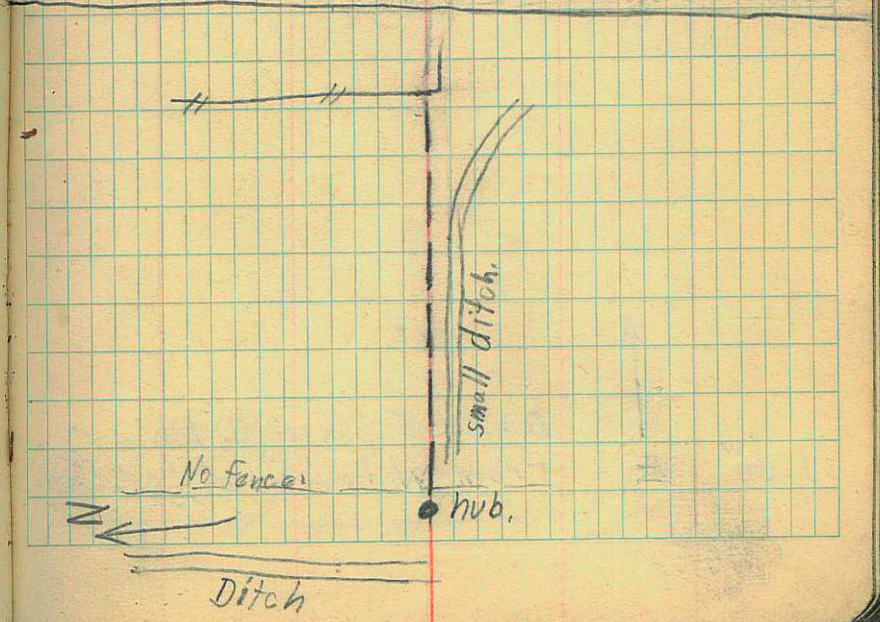
| Sta | Dir | Dist. | |
|---|---|---|---|
| 26+90 Ran. ℄ | W | 13+59.3 | to Peg. |
| | | 10+00 | C Pins |
| | | 6+70 | Fence N & S. |
| | ↑ | 3+14± | |
| 26+90 ?E | W | | from W Fence of Lane. |
| 20+27 | E | 13+42 | W fence of Lane. |
| | | 10+00 | C Pins |
| | | 6+68 | Fence South |
| | ↑ | 4+00 | ℄ of Ditch |
| 20+27 | E | | from E fence of Lane |



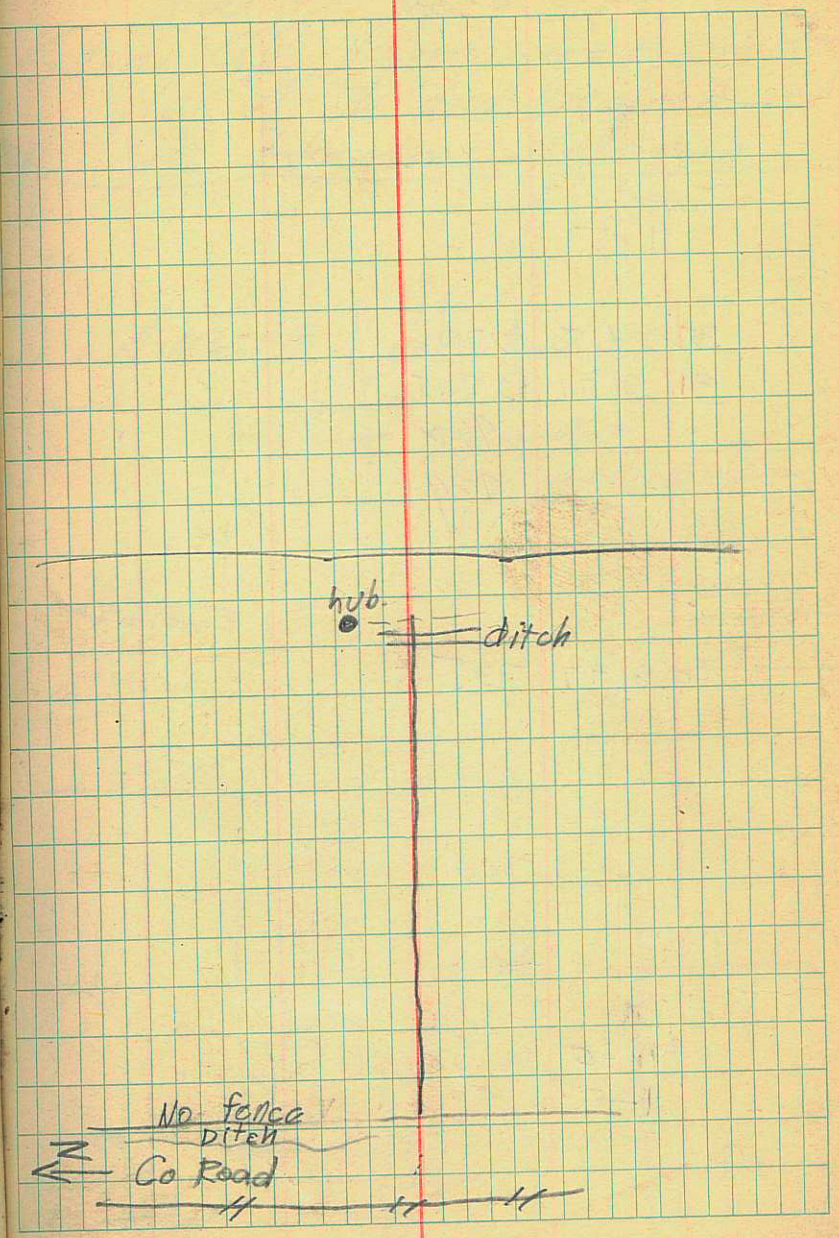
| Sta | Dir | Dist. |
|---|---|---|
| 40+24 | W | 20+82 W fence of Co. Road. |
| | | 20+43 E fence of Co Road. |
| | | 20+30 E edge of Borrow pit E side of Co. Road |
| | | 20+00 C Pins |
| | | 14+29± Fence S. |
| | | 13+87 ℄ of Ditch N |
| Rant 40+24 | | 13+66 in line with peg. |
| | | 10+00 C Pins |
| | | 6+77 Center of Ditch N |
| | | 6+68 Approx Line with fence N & single Post |
| | ↑ | |
| 40+24 ?E | W | from 1-r W of E fence of Lane |




| | | |
|---|---|---|
| 33+50S 6+92E | E | 6+92 |
| | ↑ | |
| Rant 33+50. | E | From hub. |



| sta | Dir | Dist. |
|---|---|---|
| 33+50 Rand | E | 7+29.7 in Line with hub. |
| 33+50 ?W | E | 0+52 E Bnk of Ditch from W fence of Co. Road. |



80 3309 3309

1°05'

30

32 91°50' 1370

31 91°51 1353.5

96

929

#30 91°47 735

719

700

467

201°50' W Temple Spire

145'

0



Oct 4 - 1950

Study all Riggs road west of E to and beyond W Ice House road

nail 0 of 1166.5±

nail

967

LINE N →

E 8

1300

766 FM 1300 S

nail

1370

664

55.8

41

54.1

27

743
33
710

40 24 0° 06

2693 1° 18

2027
2693 1° 40'

2027 1° 48'
~~130~~

b 1° 45

a 1° 05

30

666
2027
93

Hyrcum

20770 525
31,120

40 124

402
27
1325
660

105

120

2027 40 120

0

1°45' Auto large car point

⊙ 271°50'

32 ⊼

1°45' ℄ South

0 271°51

31 ⊼

Wind 31 if there were one

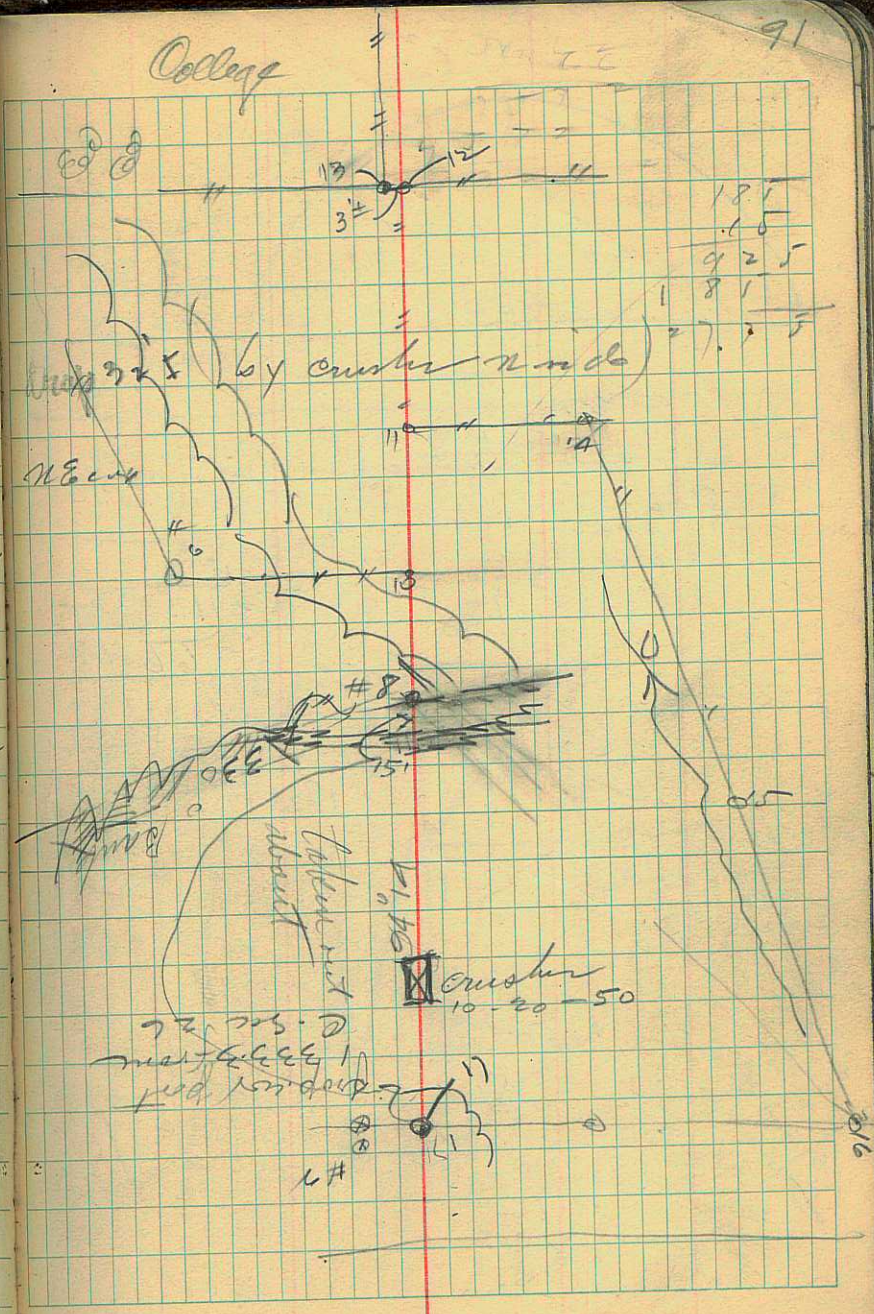
North Logan Gravel Pit.

Desc. from bk 63 p405 Deeds
Orvin Nyman & Wf to Cache Co.
for $450. 19 Aug 1927. Filed
24 Aug 1927.

"Beg at the SE Cor of the
NE¼ of the NW¼ sec 26 T12N R1E
SLB&M. & running thence North
along the section line 444 ft;
thence Southwesterly in a straight
line to a point 115 feet North.
& 12.62 Chains West of the place
of beginning, thence South
115 ft; thence East 12.62 Chains
to the place of beginning, &
further described as being situate
in the NE¼ of the NW¼ of
said sec 26, containing in
all 7 acres more or less.

12.62
66

| | | | | | |
|---|---|---|---|---|---|
| 18 | 266°30' | 182 | 10 | -8°30 | 11.85 |
| 17 | 269°24 | | | | |
| 16 | 228°34 | 65 | 5± | -3°30'± | 11.55 |
| 15 | 212°56 | 343 | 8± | -7°40'± | 11.50 |
| 14 | 105°38 | 36 | 8± | -10°01' | 11.75 |
| 13 | 88°20 | | | | |
| 12 | 88°30' | 840 | 3.00 | -5°52' | 11.52 |
| 11 | 88°20 | 350 | 8.0 | -8°± | 11.57 |
| 10 | 88°20' | [illegible] | 10. | -6°26 | 11.25 |
| 6 | 49°18' | | 4 | +1°30' | 5.65 |
| 9 | 232 | | | | |
| 8± | | | | | |
| 8 | 94°14' | 500 | 6 | -1°24' | 11.00 |
| 2± | | | | | |



πr²

200 = r

450

314
200
400000
200
200
40000
180000
360000
90
90
360
180
144
3
180

133335
66660

40

4000
160000
178000
112000
124800
62400
30
1772 9

24000
2 3187
05130
7729
40100

31.05

1300
7.23

39
3183
123

6157
39

24000
18491
5509
5473

39.1

24000 6157
18491 39.15
11890
5823
4657
6 33

38220
2 38
38220
57 23
56 57

56.5

838220
16 23
9
23.

75000
15 00.0

BS F7

5 1°23 (offset 24' E) access to Coquelsin to brow of hill at Point

4 ∧

4 238°20' 20' nail

58°20' E Temple Spire

246°46

2 ∧

2 0°

271°30' mon 4N - 7E

38°26' 5th spire.

181°023' mon 6E 5N

~~181°20'~~

181°23' mon 6E 6N

~~181°20'~~

1 ∧

4 317°24'

3

3 0° 444 nail

2

2 0° 300.12 300 -

320°56' 70.25 to hub

38°24'

271°30

1 ∧ - 3.3 Ele: 463737 = 2640.67

Study of 6E of Sugar
11-3-1950 as a
production to Lower Heights

02 33 300
6.9900
00029
0005 85
0003 2300
271600

123
36133
2712 3

270 33
238 20
3263
3303

238°20' 330°03' 16.76 23

2600 33°03' = 8383 20
16.7650
9.23
23.99

nail

02 46 30
9.230

5th NW spire
to mon 4N-7E
from Rag Hugh
271°30'

320°56' mon 6E-4N

143°55 E spire temple

5 A

14

14 39°23' 109.9 4602.37

a 39°23 39.14 pog on 6th E mon line

13 143°55 -15.56 4539.42

12 65°09

39°23 39.12 onto 6th E mon l

5 T

12 65°09'

39°23 ~~31.05~~ onto 6th E mon line

178°36 E gable end L.G. Johnson House

9 39°14

8 233°50 57.7 Hor +6°2.2 4630.66

7 26°42 107.8 shaft of streamer Hy

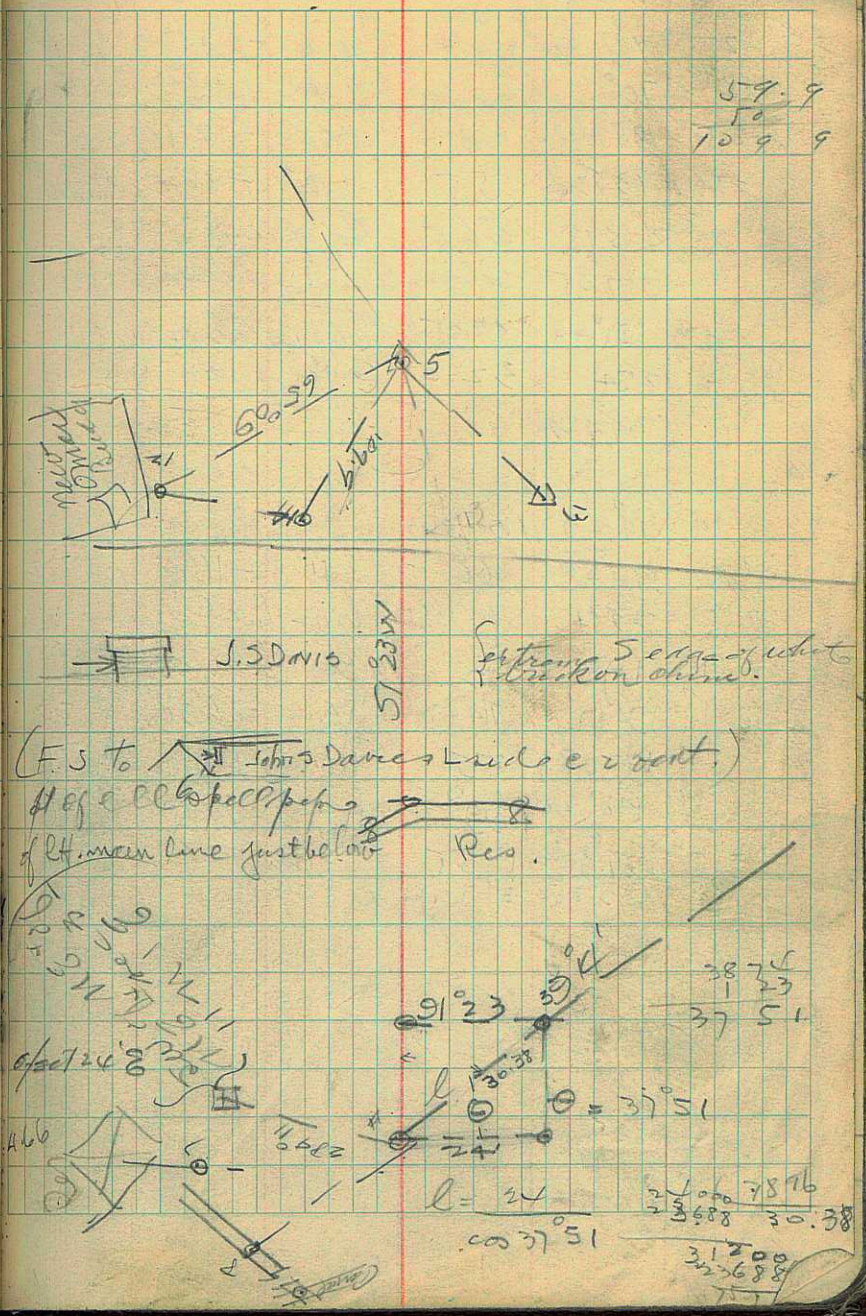
6 284°11' 219.12 SW cor of 26 T of 26 R

143°55 E Temple spire

4 181°23

5 A

E = 4619.60 4624.26



| | | Hor | | | |
|---|---|---|---|---|---|
| 28 | 4°30 | | 11.0 | -2°30 | 11.66 |
| 27 | 17°± | | 11.0 | -3°05 | 11.56 |
| 26 | 70° | | 11.00 | -3°43 | 11.50 |
| 25 | 105°20' | 79' | 11.00 | -2°10' | 11.78 |
| 24 | 137°30' | 55 | 11 | -3°04 | 11.54 |
| 23 | 113°18 | 56.50 | ℄ pump. | | |
| | 277°35 | along S side | driveway for 300' of at E. | | |
| 22 | 191°44' | 44.05 | Temp stake on S line 110' | | |
| 21 | 254° | 32.0 | Center post | | |
| | 39°23 | | | | |
| 14 | | | | 4602.5 | 4607.4 |
| | | | | E = 4602.4 | |
| 14 | 39°23 | 109.90 | | | |
| 20 | 72°50 | 66 | 11 | -16°18 | 11.72 |
| | 233 | for 60 | bior hucl | | |
| 19 | 195° | 282 | 9 | -3°30' | 11.85 |
| 18 | 194°17' | 147 | 10. | -6°36 | 11.50 |
| 17 | 177°08' | 55 | 11. | -17°00 | 11.59 |
| 16 | 140°20 | 39'± | 11 | -23°95 | 11.46 |
| 15 | 229°40' | 17.35 | | | |
| | 143°55 | E T spure | pace | | |
| 5 | | | | | 4624.7 |

Waterworks

Pipe turnover Ditch

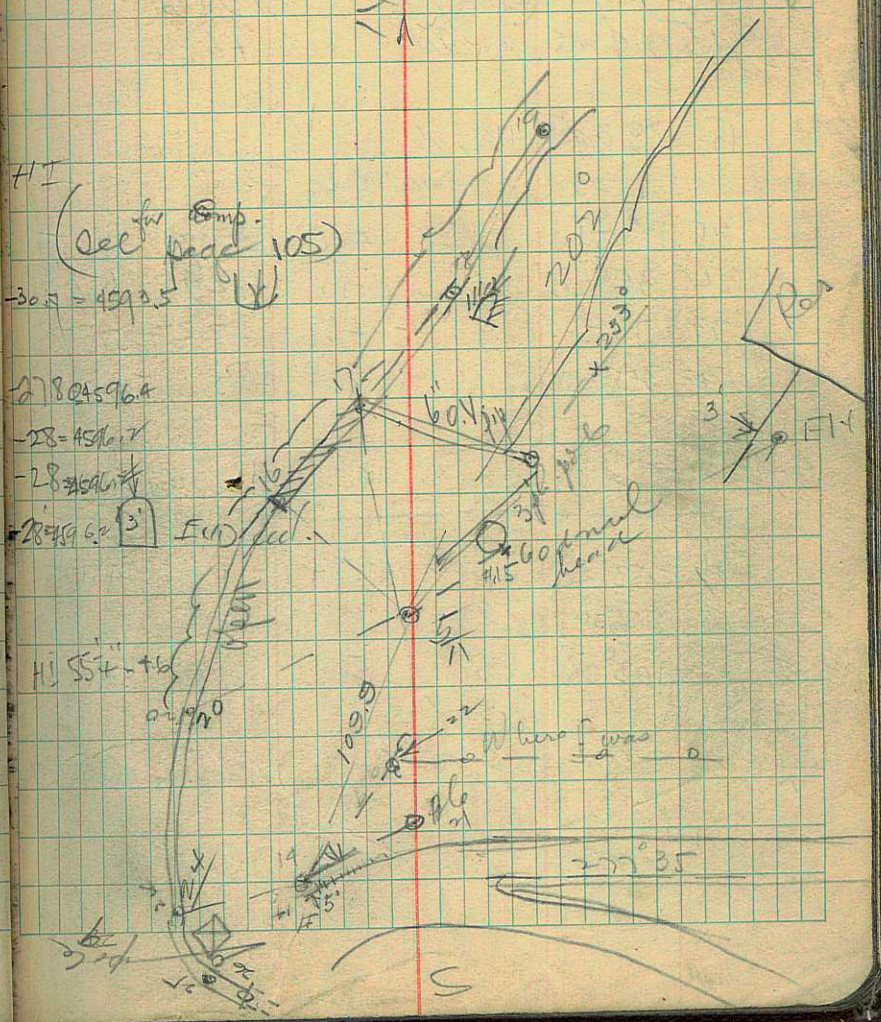
-14.20 = 4594.1

-14.40 ↑ lower end cul = 4593.90

-14.45 ↑ upper " " = 4593.95

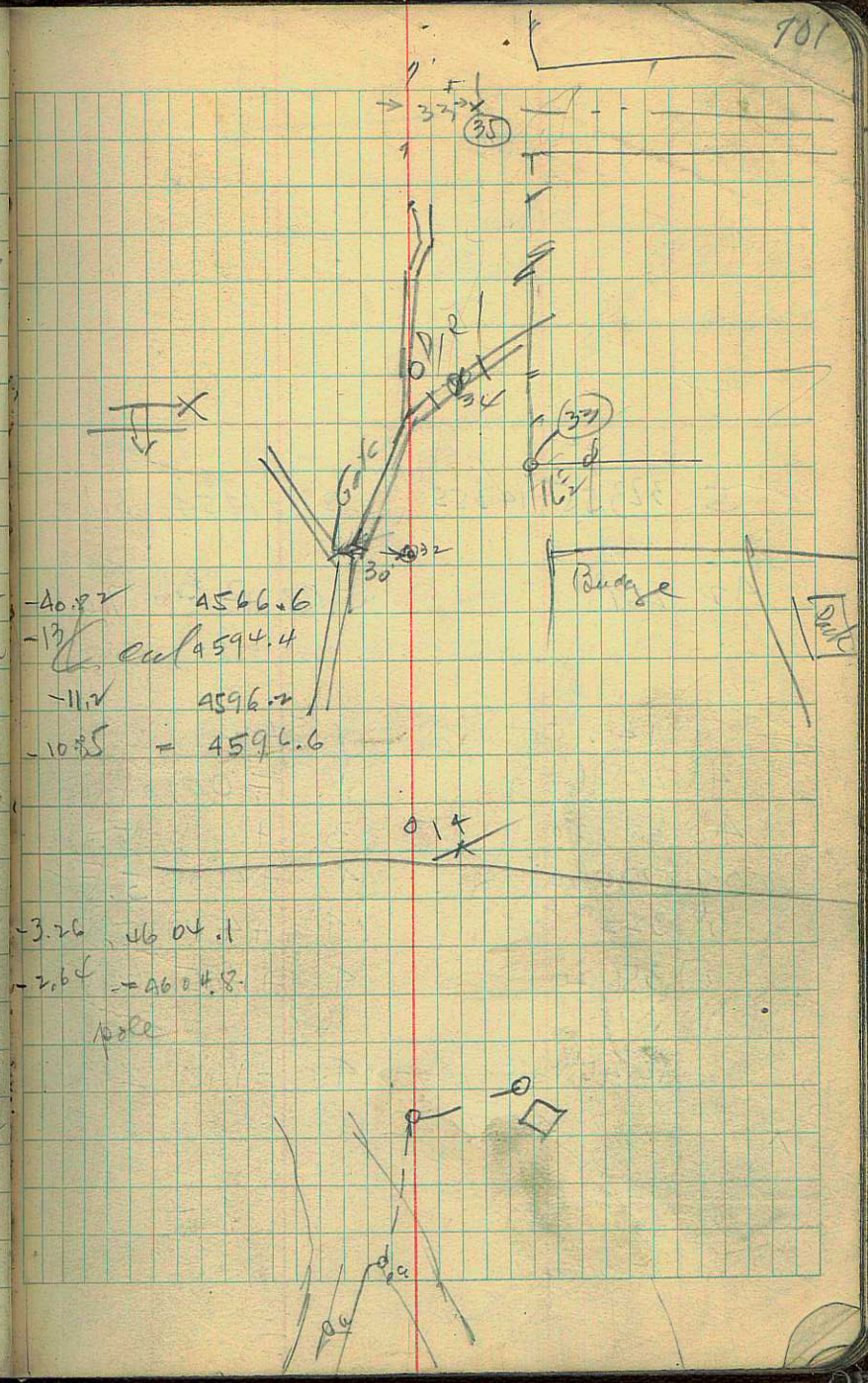
℄ stake -11.60 = 4590.8

-14.3 = 4593.1



| | | | | | | |
|---|---|---|---|---|---|---|
| 45 | 245°06' | | | +4°08' | | |
| 14 | 268°39' | | | | | |
| 13 | 182°35' | | 8 | -9°35' | 11.38 | |
| 12 | | | | | | |
| a | 219°23' | (109.9 = 39.15 hor) | | +3°50' | | |
| 5 | 219°23' | 109.9 | | +6°36' | | |
| 12 | 88°39' | 119.36 | | | | |
| | 1°23' | approx. dir to Point. | | | | |
| 35 | 0°51' | | 4. | -2°28' | 11.65 | -40.87 4566.6 |
| 34 | 358°20' | | 4. | -2°18' | 6.00 | -13.[illegible] cal 4594.4 |
| 33 | 7°05' | | 4. | -2°22' | 5.57 | -11.2 4596.2 |
| 32 | 358°08' | | 4. | -3° | 5.2 | -10.25 = 4596.6 |
| 14 | | | | 4602.40 | 4607.4 | |
| 31 | 283°20' | | 2.4 | 0° | 4.12 | -3.26 4604.1 |
| 30 | 276°50' | | 2 | 0° | 3.29 | -2.64 = 4604.8 |
| | 103°08' | | 5 | | 5.56 | pole |
| 14 | | | | 4602.4 | 4607.4 | |





| | | | | | |
|---|---|---|---|---|---|
| 5 | 323°55' | -143°55' | 2 | +14°54' | 5.16 |
| 42 | 259° | | 5.48 | +2°30' | 7.0 |
| | 143°55' | E Temp Spire | | | |
| 41 | 208°16' | | 1 | ±0°03' | 4.95 |
| 40 | 247°30' | | 3 | + | 5.1 |
| 39 | 270°30' | | 4 | +2°30' | 5.55 |
| 38 | 322° | | 4 | +4°07' | 5.8 |
| 37 | 356°20' | | 4 | +1°05' | 6.05 |
| 36 | 128°45' | ~~4539.42~~ E = 4539.42 | 4.0 | -1°10' | 4.15 |

13 / 12 X

Helpers
Robert L Olsen
C Jones

Nov 6 - 1950

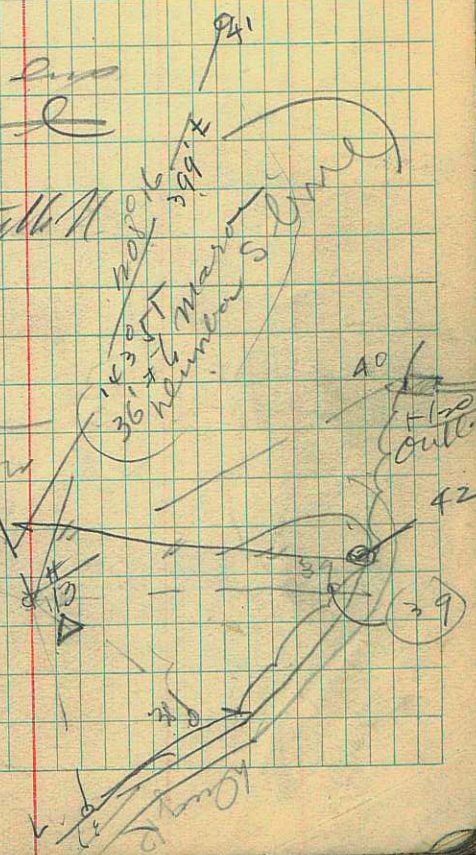
+0.4' on 4544 Manor S line
~~on Manor S line~~

{ about in Cutlett
{ ≈ 1625

A 4545.1 ±

+2 - 4546.4
+8.1 - 4552.5
-1.0 - 4543.4 Logan Pure

-6.50 Pressed Dial 4537.9
-5 = HI ± 4544.4 13

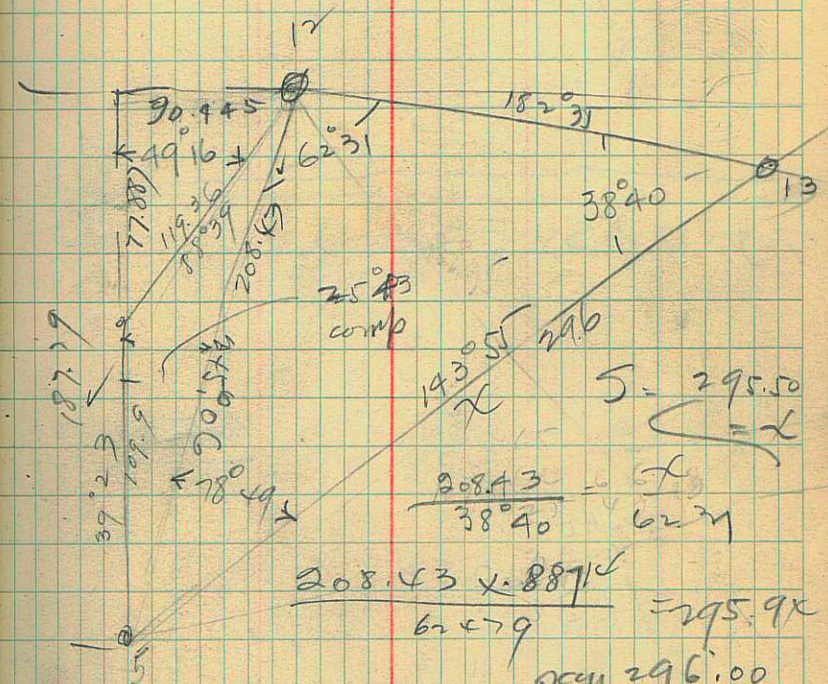


119.36 × .65275 = 77.887
119.36 × .75775

90.445 = .48163
187.79

187.79
90.445 = .48163

77.887
109.9
187.787




$$\frac{208.43 \times .8871}{62.79} = 295.9x$$

say 296.00

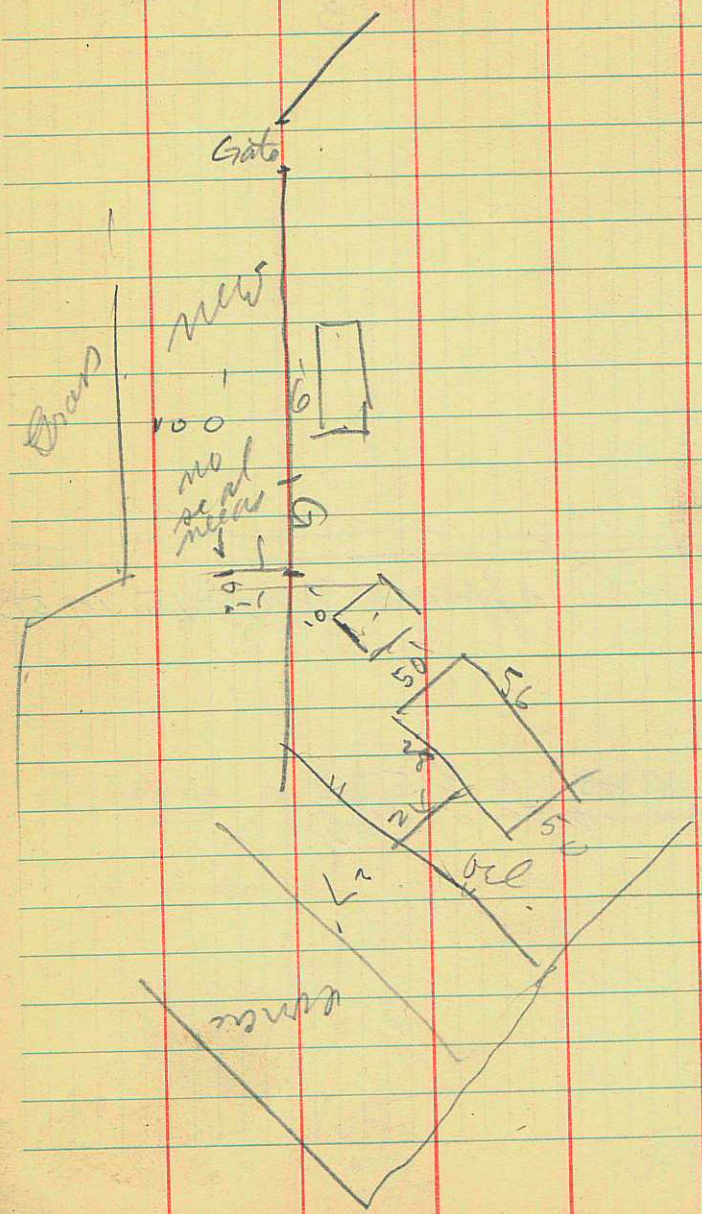
| | BS | FS | | |
|---|---|---|---|---|
| Top 5 | | 5.50' | 4619.59 | |
| a | 2.90 | | | |
| | | 7.52 | | |
| | 0.77 | | | |
| | | 11.73 | | |
| | 3.30 | | 4637.37 | 4640.67 |
| | | | 17.78 | |
| | 6.9 | 4.75 | | |
| | | 6.97 | 4619.59 | |
| | | 17.78 | | |

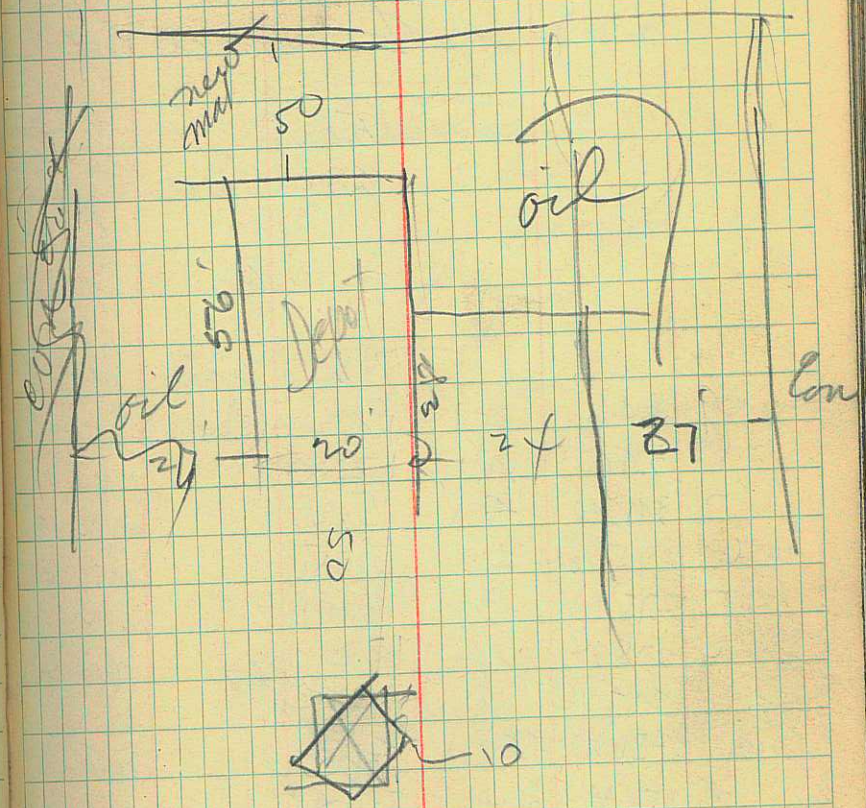
96 (a 7)
3
45

Levels, approx. Nov 15, 1950

{ approx. as a to 5 is a sight about 5000' long.

Air port already



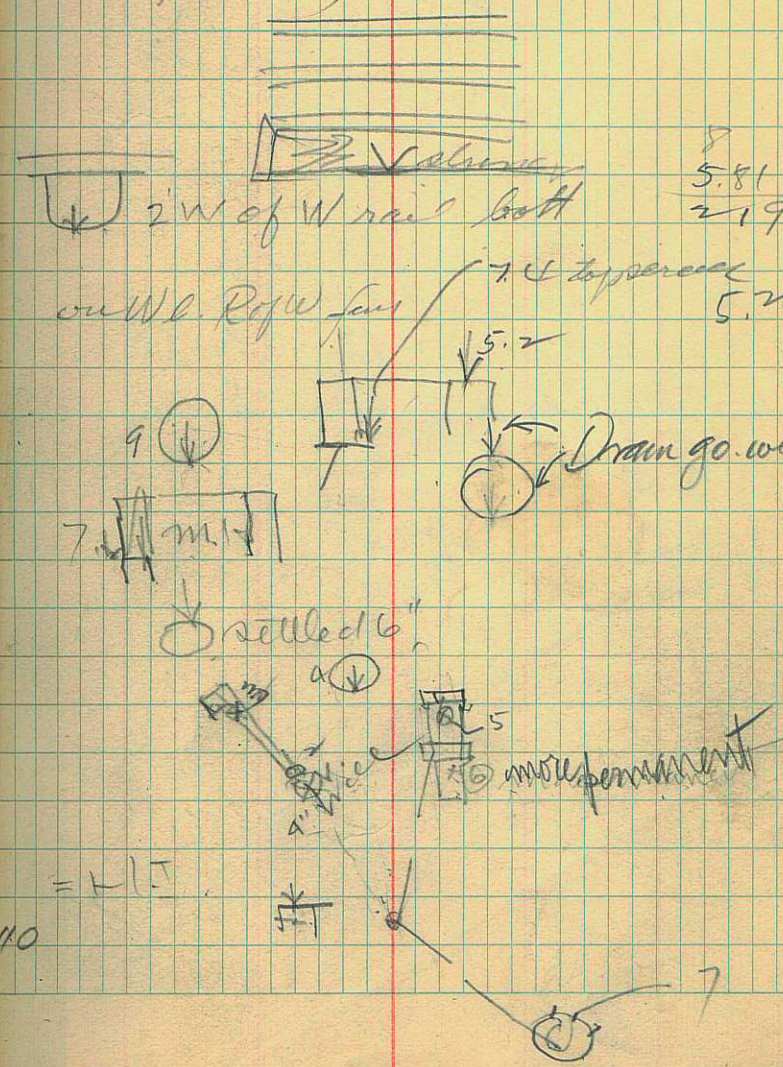
| | | | | | Elev |
|---|---|---|---|---|---|
| Spud | | | | | |
| 48 31.12 | | | | | |
| | | = 3850' ± | | | |
| 31.85 | | | | | |
| | | (7.75 | | | 102.45 |
| 272 in up ℄ Sawmill lite | | | | | |
| | | | 5.04 | | 104.96 |
| | | | 6.80 | 6.6 | 103.12 7.27 |
| | | | | 6.2 | 6.58 |
| | | | 7.0 ± | Mill top open | 102.6 |
| 9 | 346 | 41 | 14.2 = | (5.2+9.) | 95.8 |
| 8 | 346° | 41 | 12.0 | | 98. |
| 7 | 341°40' | 41 | 5.78 | | 104.22 |
| 6 | 275°24' | 30 | 5.55 | | 104.45 |
| 5 | 275°24' | 33 | 5.81 | | 104.19 |
| 4 | 275°24' | 36 | 8.0 | | 102.0 |
| | 289°36' | | ← solo | | |
| 3 | 250°30' | 28 | 5.63 | | 104.37 |
| 2 | 256°44' | 24 | 5.67 | | 104.33 |
| | | | 4.9 | | 105.1 |
| | | | 5.2 | | 104.8 |

1 ^



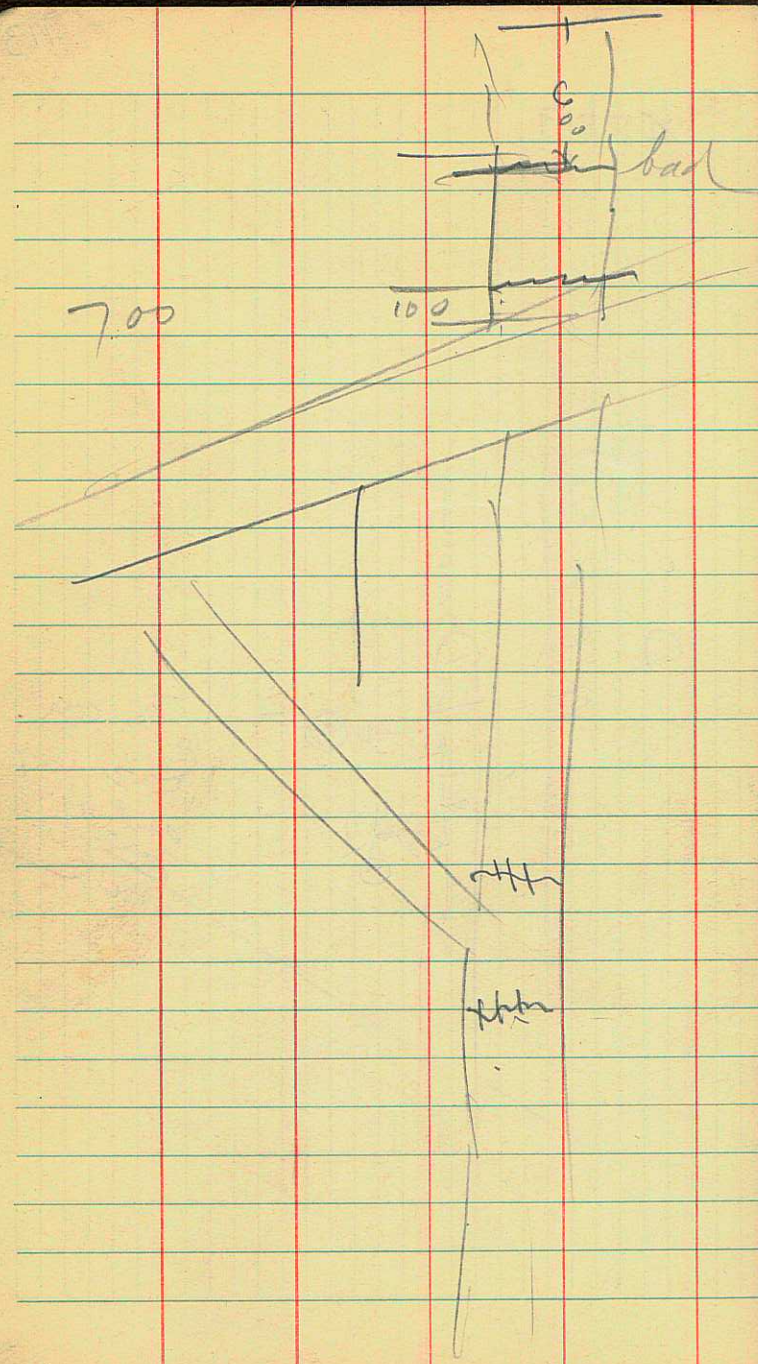
LT Study out at Sequim
Cache Co Air Port 1-12-51

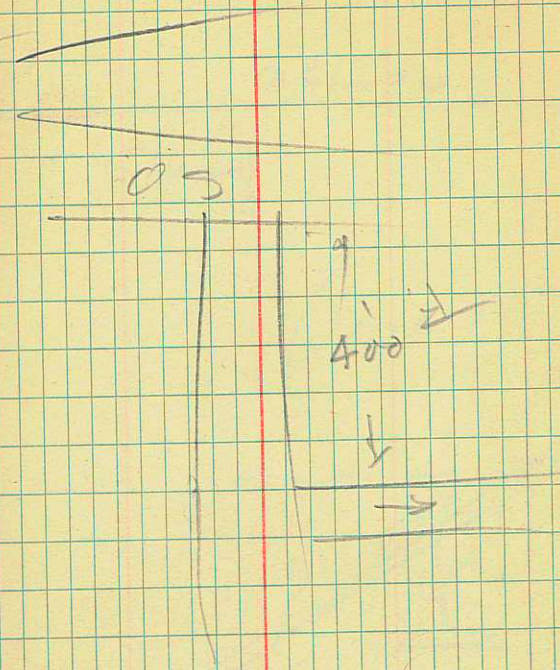
at Saw mill ditch
Grade of inlet)

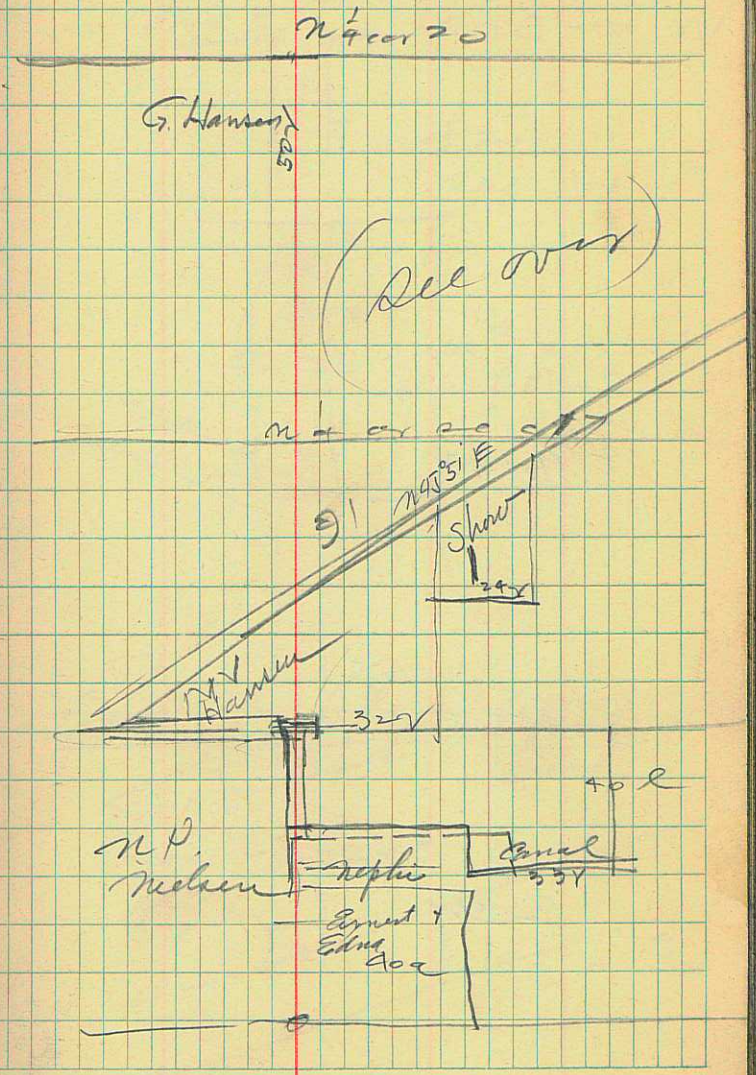



40

4889+


bad
700
100


400


N ¼ cor 20
G. Hansen
(See over)
N ½ cor 20
Short
24 r
32 r
40 e
N. P. Nelson
Sophie
Ernest & Edna
40 a
Canal
55 r

Speed

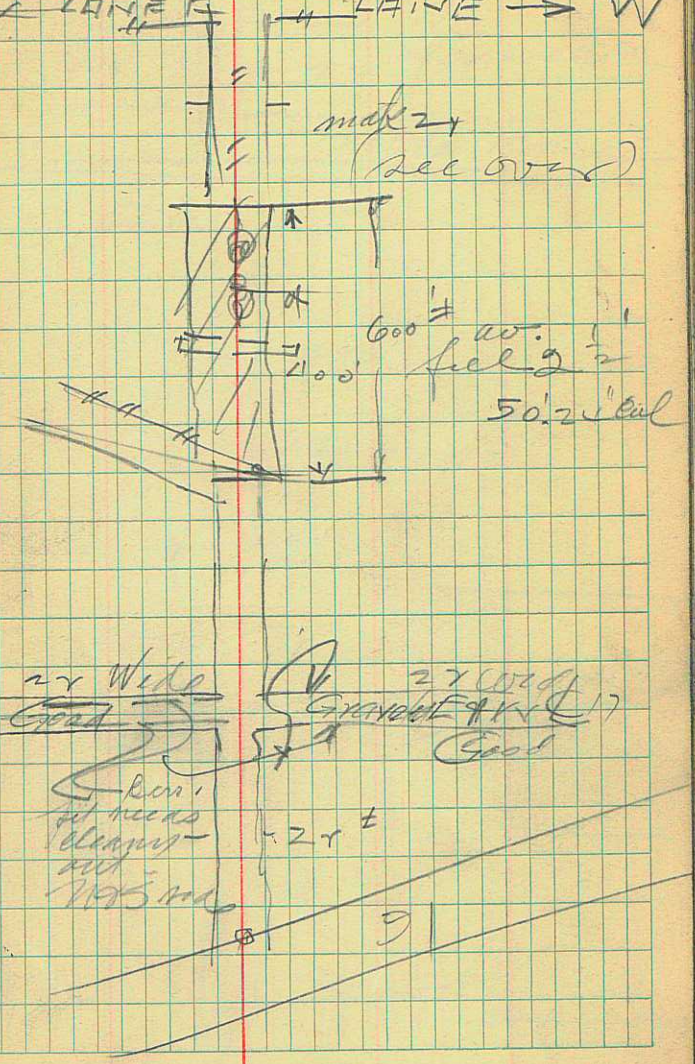
92.92

92.72

92.52

April 11 – 1951

Study of road from 91 & J. first one of both move down

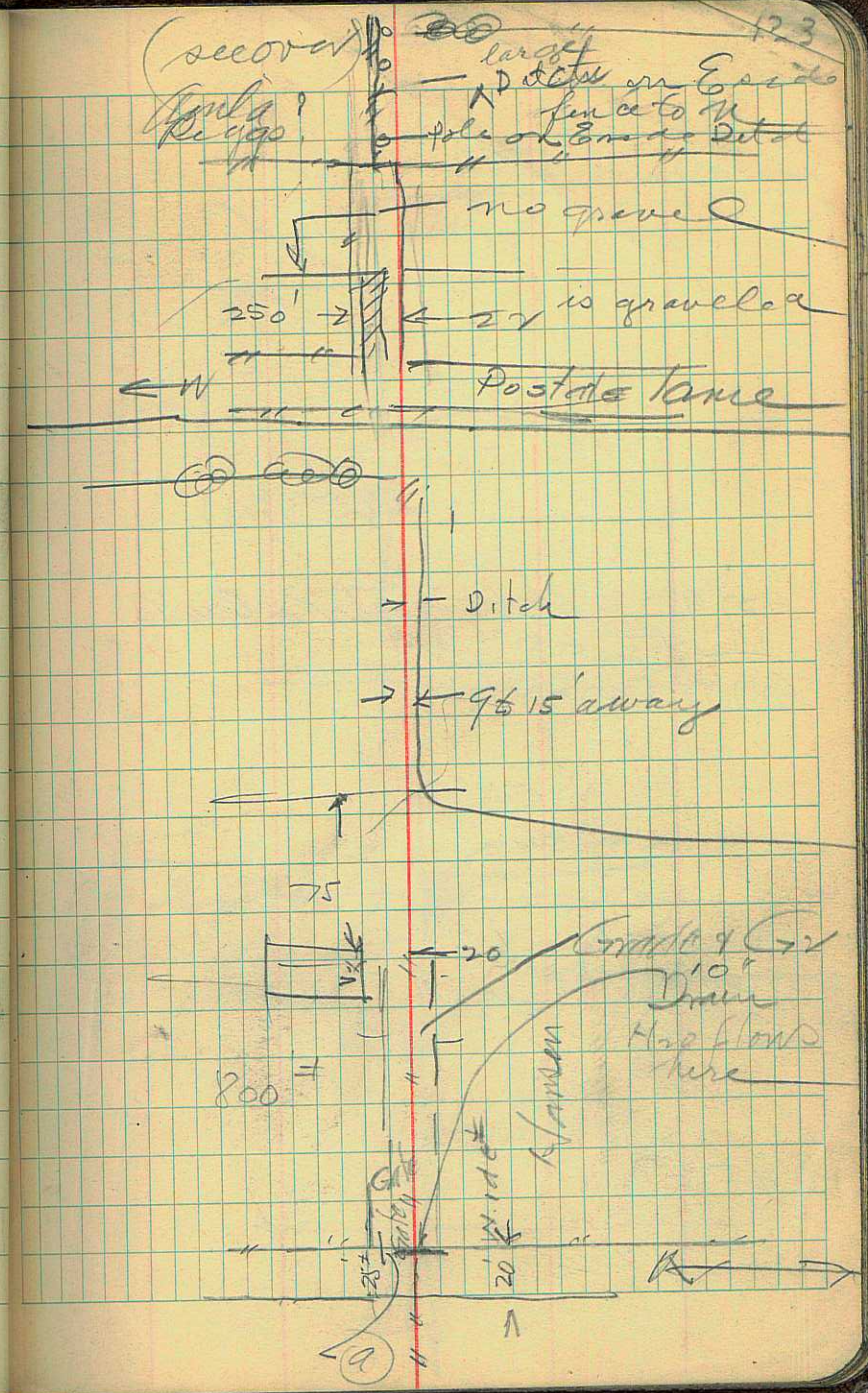


speed

927.65

(a) 927.60



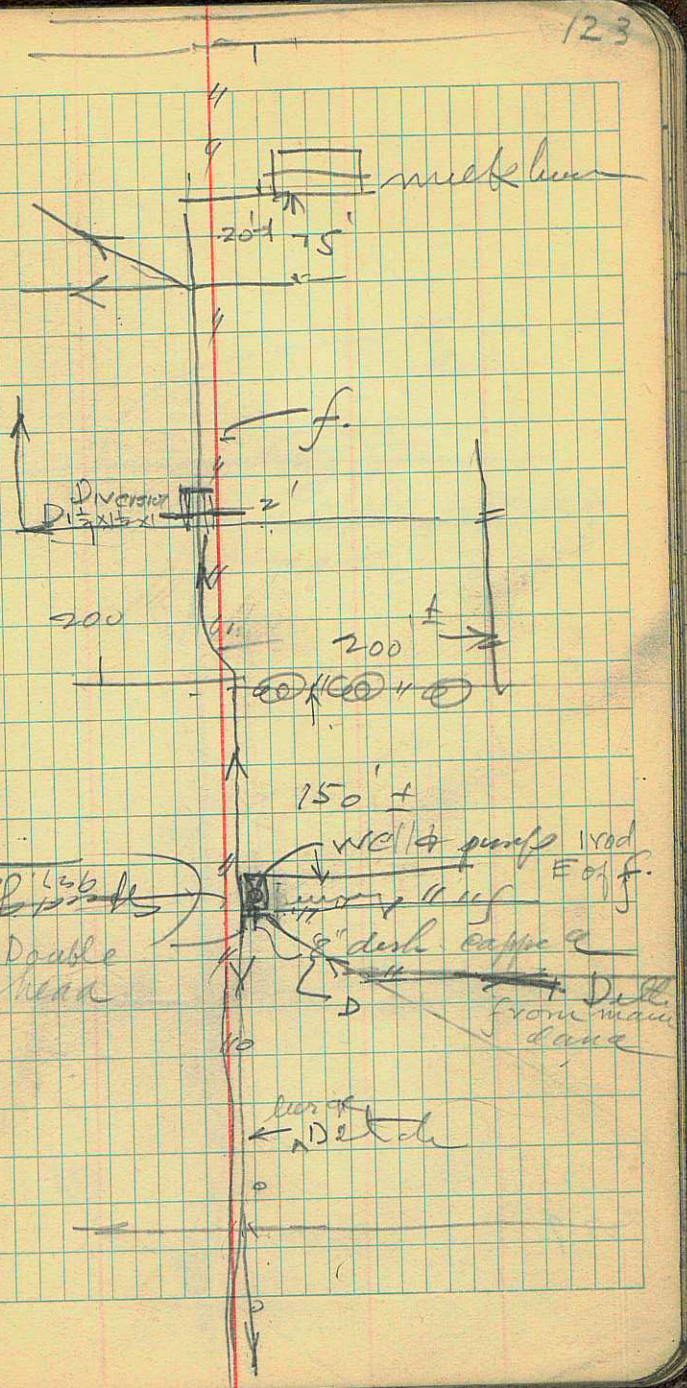


927.9 gos to Postal Card

927.75

927.65

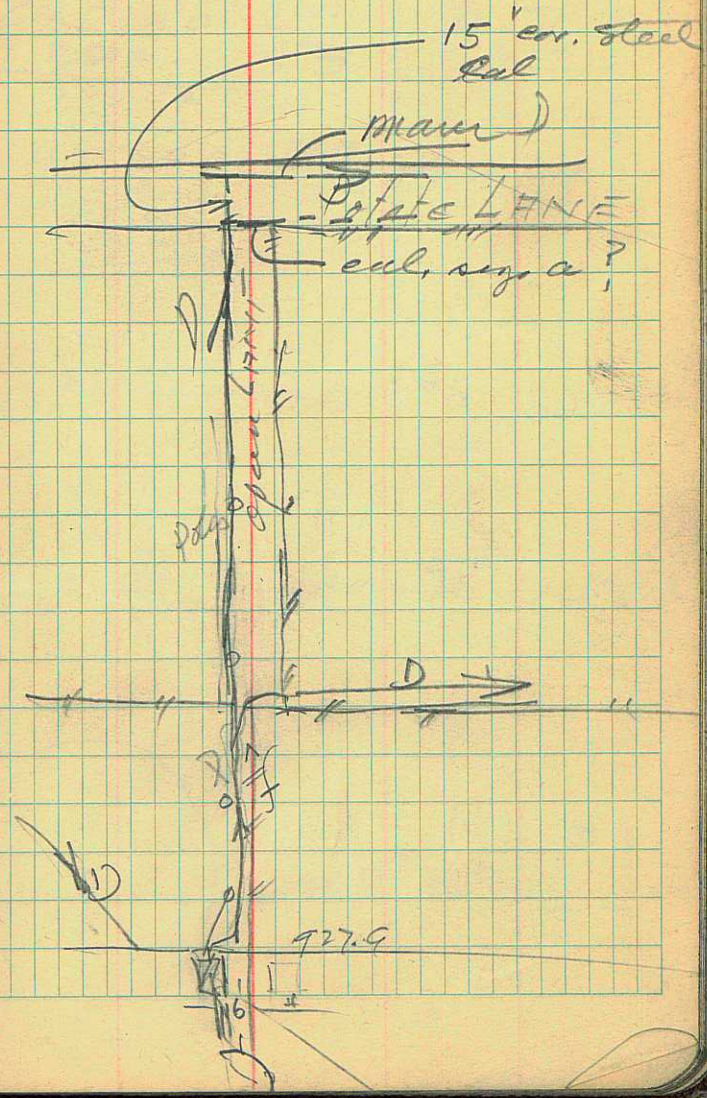




928.2

928

927.9



5

176

1560

9000

15

2600 | 80

560 | 16.5

435600 | 800

49000

306.00

435600 | 820

4100

2560

2560

1000

531

6570

660

270°

stake

90

stake

270°

stake

stake

90°

stake

drive 1 ft

90°00

560 0°

330 0°

0

6283

584

4905

404

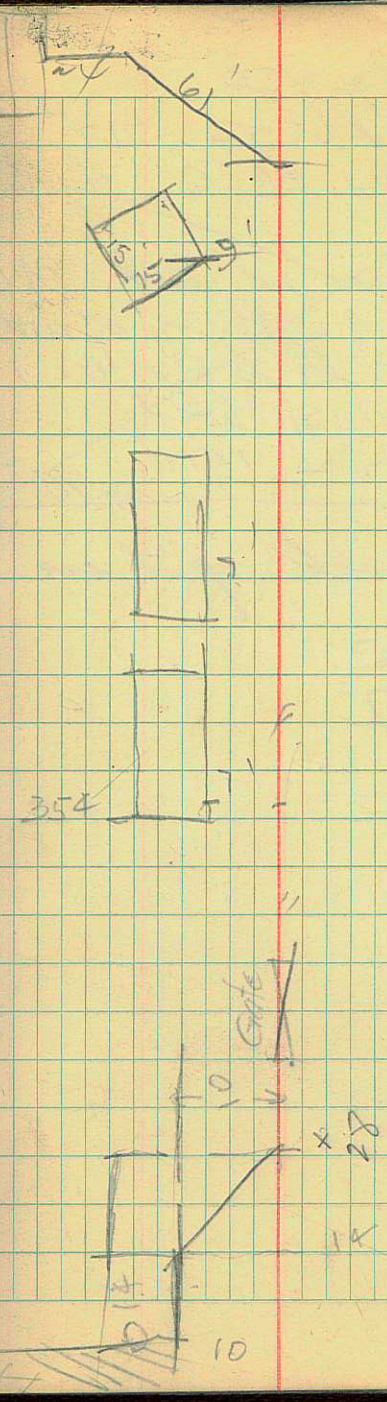
384

354

56

N 43

N+ 28



Book 48 - Pag 450

#165 M 721, 717 □'

Part of Blk 4 Pl "C" Hy. City Survey

Beg at SW cor of Blk N 160' 65 l O, L & I Ry. r of way S Nearly at S l of Log W 177' S 94' W 171' to Beg

(out) 1-27 - 1917

in MW ¼ Sec 5 10 N 1 E

Other gravel pit on S

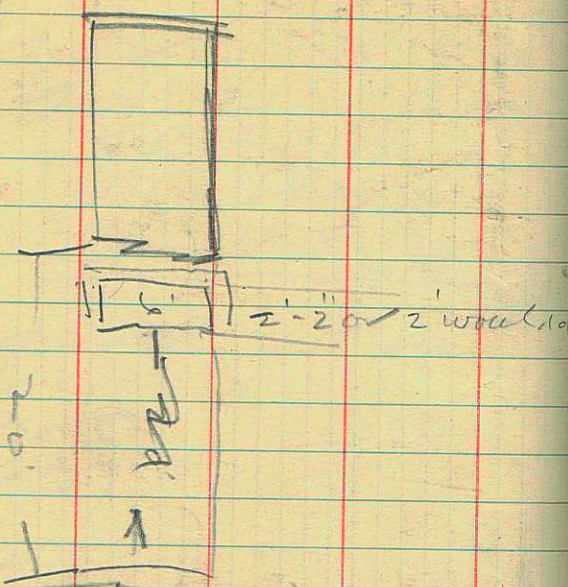
27-509

75-305

69-637

+27-51

N Hyde Park on main St.




+27-51

Study of old bridge on above Son Miles

From Ruth Coburn Grantor to Cache Co.

Beg at a pt. 15.93 ch S. of 13.41 ch E of the NW cor sec 32-11-1E N 60' W 7 ch ± thence S Easterly to a pt 5' 74° 19' 36" W 6.876 ch of b y N 74° 19' 36" E 6.876 to beg 1 ac - 69-637

75-305 Ruth L. Coburn to Cache Co.

Beg at NE cor of the Gravel pit as at pres exists 77 ± 76 x 86 ch S 9 13.41 ch E of NW cor 32. N 320' W 390' S Easterly to pt ~~beg~~ W of beg. E. to beg.

may 3-1907

97-509 - Meredith Times & wife - to Cache Co.

Beg at + S L of NW ¼ of NW sec 3 + - 9 E sec Co. Road 19.95 ch S & 6.41 ch

E of NW cor sec 3x

S 89°59' E 7.00 ch

N 0°01' E 3.82 ch

S 74°19'30" W 6.876 ch

to E & Co Road

S 13°29' W along rd 1 ch

S 8°55' W 1 ch

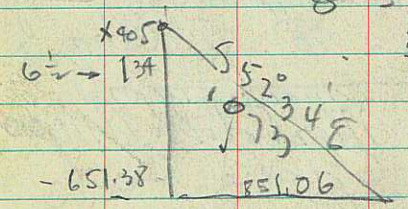
to beg 10.96 ch ac

Book #1 - page 14

42
58
100

1341
66
8046
8046
885.06
3
851.06

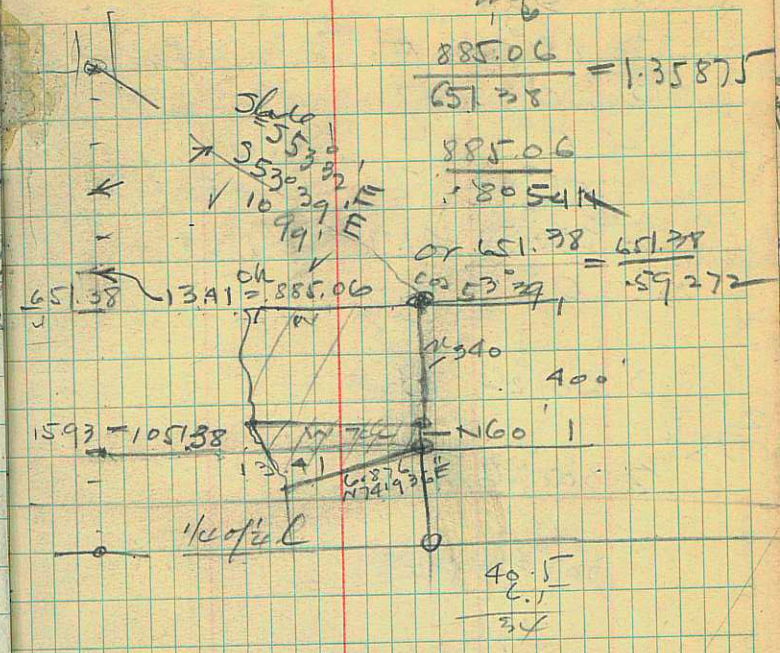
℄R



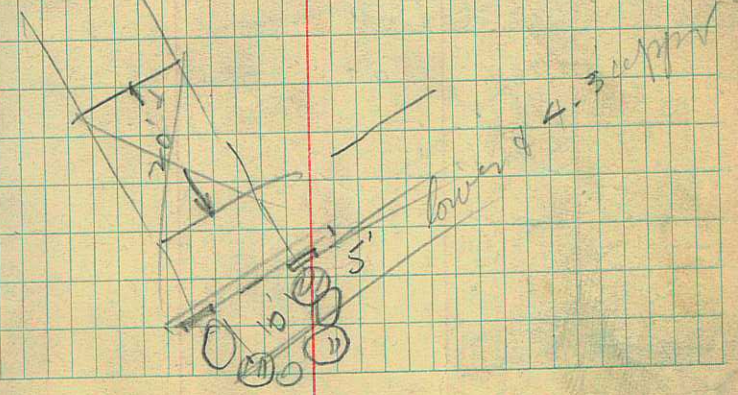

851.06 / 651.38 =

851.06 / 651.38 = 13
1996 8






Summit Creek about 1/2 mi



Sec Tonage

6 6 30 4 brookhill 5.12

18°06 E Temp spur

#5 0° 670 5. 11.7

1 0° f 9.0 5.7

55°22 ℄ So. Cache Chum

28258 61.70 ℄ port

0° 11.0

3 30°26 73'

2 30°26 1000

30°26 814

30°26 747

30°26 712' ± ℄

30°26 650

300

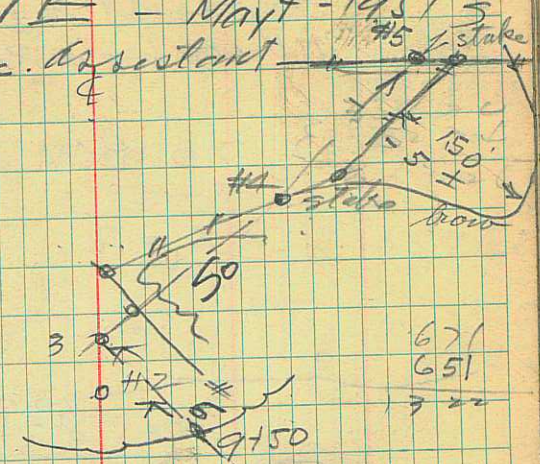
30°26

1



Survey Gravel Pit in sec 34-11-1E - May 4-1951

Seepage 130 to desc. Approximant



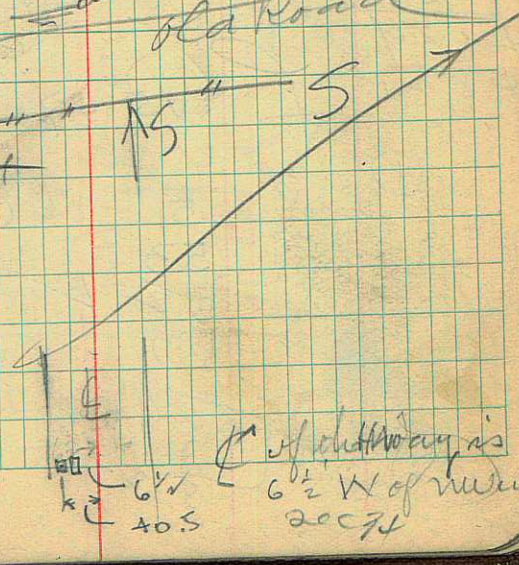

on foot

Dirt

fence

old Road

in V I C cut



Obs at 3h E of
MV cor sec 3h

3 30 PM

5.5

10 - h

5.81

8960
21.39
68.21

9 - 2h

h = 15° 57.02 Co θ = 48°

8° 51'
8° 53
8° 52
53

4 | 204 | 5
5 2/5

151

10.50
12
22.50
90.00
3.00

C = +15 39.9
+ 16.42

+15 56.32

3h angle
+15° 57.02

225
73
675
1575
16425

359760
52374
307726
5946

851.06 | 65.38
65.38 1.30655
199680
195412
4268
3908
3577
3266
3200
5 52° 34' E 1073

851.06 | .79335
79331 1073
577100
573345
17550
23805

Use 8° 52'

665 10.08

9.92

√33,000 = 2016

1.67 9072

9072

94.99 3 6

9.92
66
5952
5952
654.72

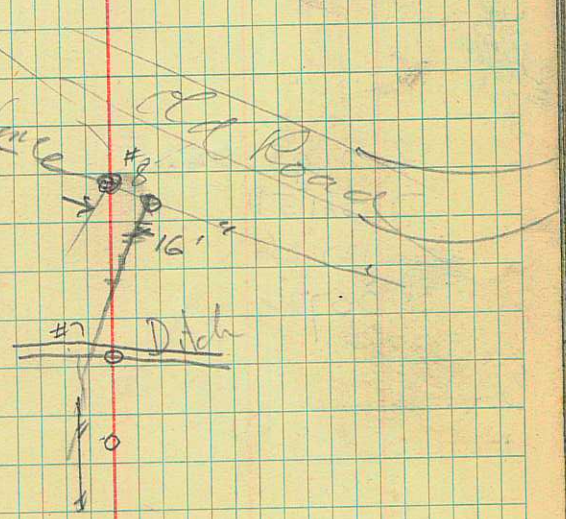
8. 90° 9.00 -14°17 11.0

~~8 90° 9 11~~

7 90° 10 -13°30 11.5

55°03 to So. Cach Chun

6F



8 269° 40' 654.72

3

7

8 269° 40' 0

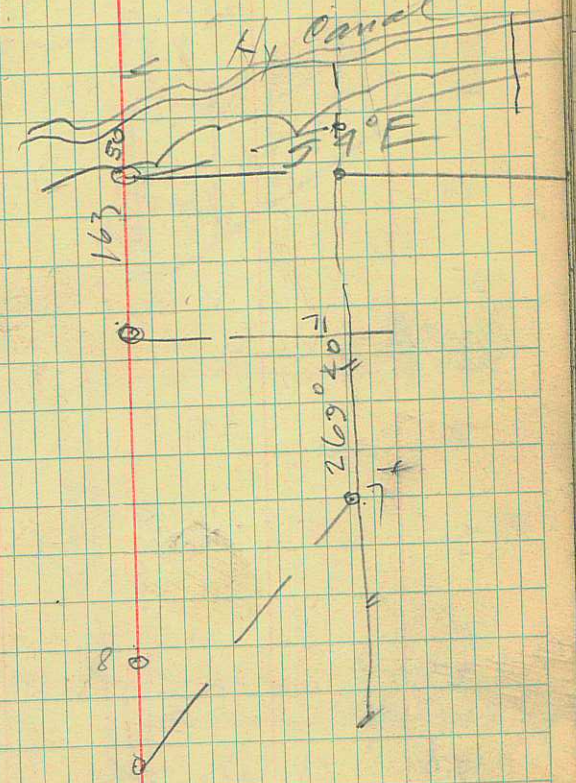
7 34° 50'

127° 26'

307° 26'

3

Resurvey



| | BS. | FS | HI | | |
|---|---|---|---|---|---|
| 10 | | | 10.5 | 62.53 | |
| 9 | | | 10.3 | 62.73 | |
| +15 | 5.65 | 4.85 | Pav. | 446.7.38 | 447.3.03 |
| 8 | | | 10.0 | 62.23 | |
| | | | 8.5+ | 63.73 | |
| 7 | | | 10.50 | 61.73 | |
| 6 | | | 10.8 | 61.43 | |
| 5 | | | 11.3 | 60.93 | |
| +84 | | | | | |
| 4 | | | 11.1 | 61.13 | |
| 3 | | | 10.8 | 61.43 | |
| 2 | | | 11.0 | 61.23 | |
| +99 | | | 10.75 | 61.48 | |
| +80 | | | 10.7 | 61.51 | |
| +78 | | | 11.3 | 60.93 | |
| 1+ | | | | | |
| 0 — | +9.80 | | 12± | 496.43 | 497.23 |

Survey of road in Arnold & large cut drain west of N

Pole

8+15

5.70 ∠ 68-1½

bet Lerdin east

North

14+85

Dug

1+99

Roy Barnaby

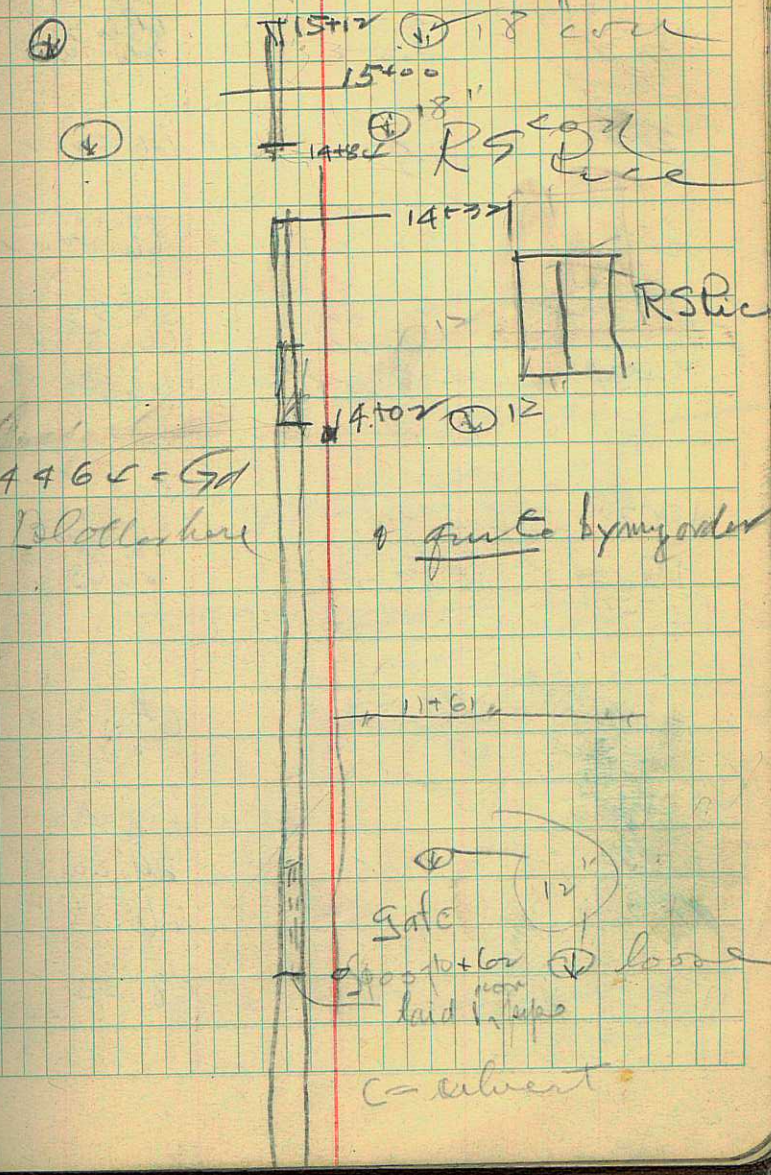
Aging 12" pipe

18" corr

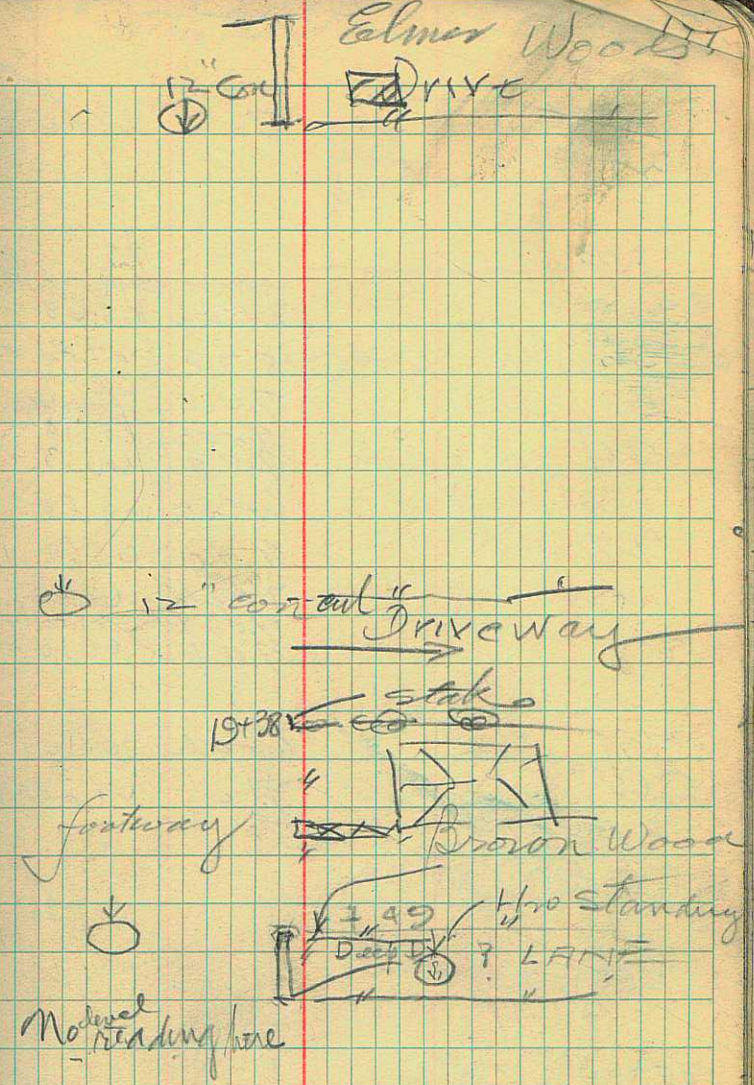
top 2½ cut

| | BS | FS | | | |
|---|---|---|---|---|---|
| 17 | | | 6.5 L<br>8.8 B° | 68.33<br>66.03 | |
| 16 | 6.45 | 4.65 L | | 4468.38 | 4474.8 |
| +12 | | | 7.1 B old Bpt<br>5.2 L<br>8.1 C | 65.93<br>67.83<br>64.93 | |
| 15 | | | | | |
| +84 | | | 8.3 C | 64.73 | |
| +32 | | | 7.9 | 65.13 | |
| ~~+37~~ | | | | | |
| +02 | | | 8.1 L<br>5.4 L | 64.91<br>67.61 | |
| 14 | | | 7.9 | 65.13 | |
| 13+25 | | | | | |
| 13 | | | 10.0 | 63.03 | |
| 12 | | | 10.0 B | 63.03 | |
| +61 | | | | | |
| 11 | | | 9.9 B | 63.13 | |
| +80 | | | 10.1 C | 62.93 | |
| +62 | | | 10.1 C | 62.93 | 4473.8 |
| 10 | | | | | |

B° 2 Barrow pit



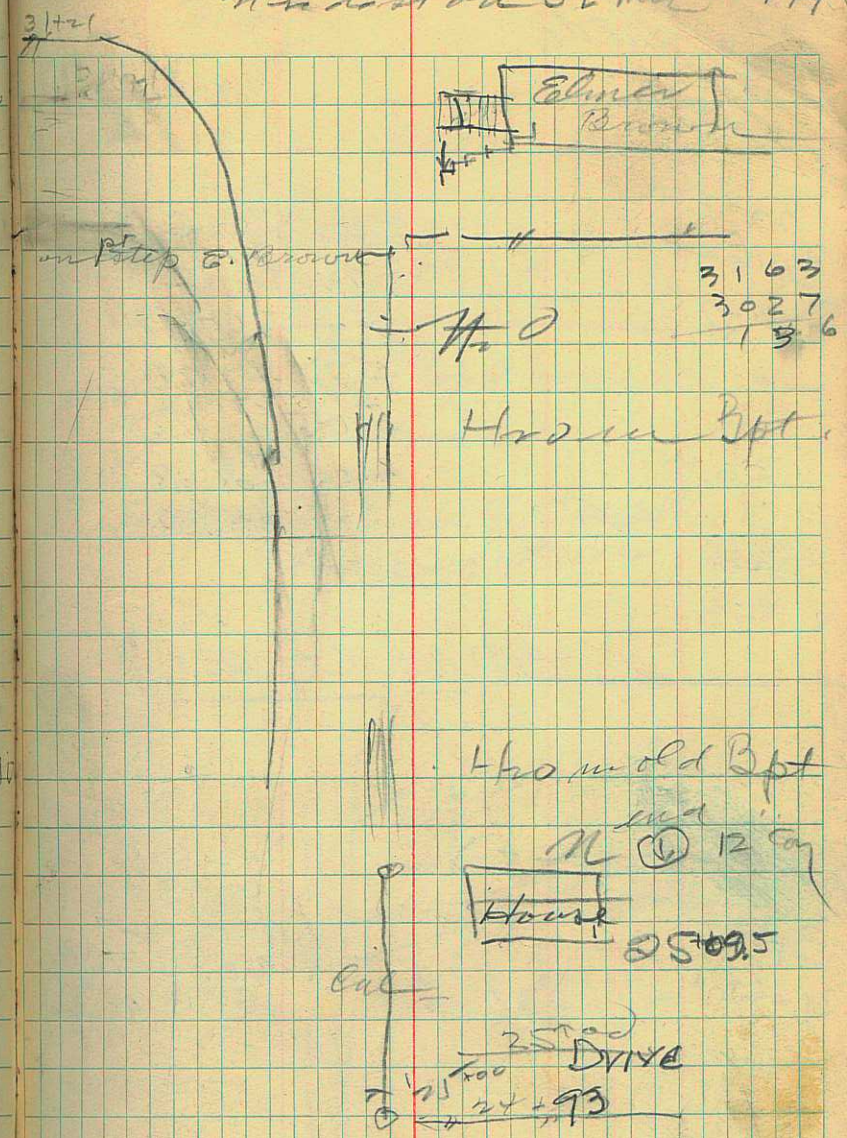
| | | | |
|---|---|---|---|
| | 8.8 c | 67.30 | |
| +93 | 6.5 | 70.65 | |
| | 6.3+5.07 h | 4469.76 | 4476.1 |
| 24 | 8.00 c | 66.83 | |
| | 5.2 h | 69.63 | |
| 23 | 8.2 c | 66.8 | |
| | 5.1 h | 69.73 | |
| 22 | 7.9 c | 66.93 | |
| | 5.73 h | 69.10 | |
| 21 | 8.00 c | 66.83 | |
| | 6.3 h | 68.53 | |
| 20 | 8.3 c | 66.53 | |
| +54 | 8.4 | 66.43 | |
| 19+38 | | | |
| 19 | 6.09 h | 68.74 | |
| | 8.2 c | 66.63 | |
| 18 + 76 | | | |
| +49 | 7.7 | 67.13 | |
| +28 | | | |
| 18 | 5.6 | 69.23 | |
| 18 | 8.5 B° | 66.33 | |
| 17 | 6.5 h | 68.33 | |
| | | | 4474.53 |




B° = old barrow pit

| | | | |
|---|---|---|---|
| ~~+31~~ 31 | | 8.00 | 68.16 4476.1 |
| +33 | | | |
| 30+00 | Am | 4.22 | 4471.88 |
| | | 7.42 h | 68.68 |
| 30+00 | | 8.7 c | 67.40 |
| | | | 68.64 |
| 29 | | 7.66 h | 68.64 |
| 29+00 | | 9.00 Ho | 67.10 |
| | | 9.8 c | 66.3 |
| 28 | | 6.6 h | 69.50 |
| 28 | | 9.7 c | 66.4 |
| 27 | | 7.20 h | 68.90 |
| | | 9.00 Ho | 67.10 |
| 27 | | 9.9 Bpt | 66.0 |
| 26+00 | | 6.00 h | 70.10 |
| 26+00 | | 9.1 c | 67.00 4476.1 |
| +45 | | | |
| +09.5 | | | |
| 25+00 | | | |

31+83.7 ~~[illegible]~~ Meridian on 3 L Mc



Shed

E

30+27

31+62

30+27

5.42 67.26

66.26

66.53

4.70 67.98

5.05 67.63

4.00 68.68

68.28

30.+

4.4±

May 25, 1951

5.98 h 70.12

8.1 on H-O 68.00

31+83.7

31+63

bot 9.36 66.74

top 8.00 68.10 44761

May 151

1930 me

5

4.4

66.50 30.33

67.

8" wood control

top 8" wood pipe

top 4" [illegible]

Step-in Elmer Wood Basement out

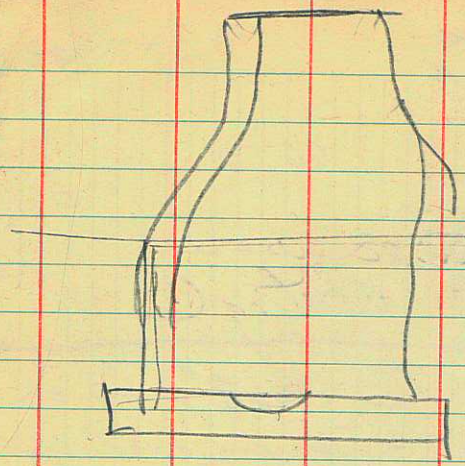
72.68

67.98

Open

Contained

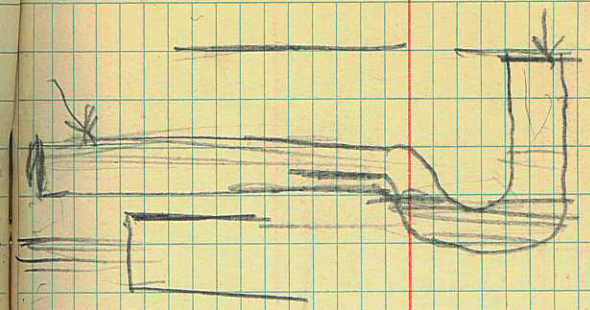
18"



2. 5.5
5.5
27.5
27.5
30.25
28
30
23.40
7
1
.6
3.5
3
10.5
7
3.5

27
3
1

.16
36
4
56
180
30
5
15



1.8
20

68.68
5.87
7K 5.5
3 8 0
70 7 5

3.80
18.0
2.00

74.55
6.66
67.89

3.27
6.66
5.61
.79

67.89
67.89
.00

72.68
5.01
67.63

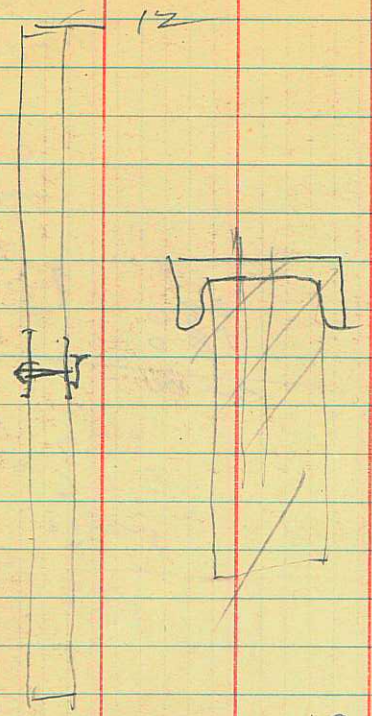
3.80 70.75
6.66 67.89

30+27

30 5.87 h 68.68 W 74.55

on pavement front of garage

top 8" Wood




1320
651
668
1320

1995
651
44
1995

# CURVE TABLES.

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## HOW TO USE CURVE TABLES.

Table I. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

### *EXAMPLE.*

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = 23° 20′ to the R. at Station 542 + 72.

Ext. in Tab. I opposite 23° 20′ = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

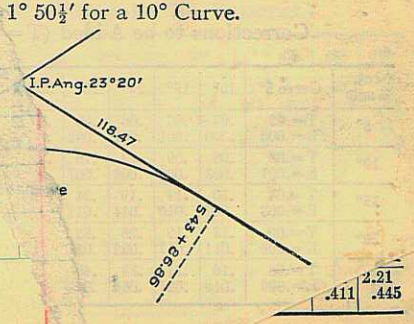
Tan. in T[illegible] ° 20′ = 1183.1
118.31.

[illegible]′ for a 10° Cur. = 0.16
[illegible] = corrected Tangent.

[illegible] required find in same way)
[illegible]3.33° ÷ 10 = 2.3333 = L. C.

| | | |
|---|---|---|
| [illegible]542 | I. P. = sta. | 542 + 72 |
| [illegible]+50 | Tan. = | 1 .18.47 |
| [illegible]543 | B. C. = sta. | 541 + 53.53 |
| [illegible]+50 | L. C. = | 2 .33.33 |
| 543 + | | |
| [illegible]6.86 | E. C. = Sta. | 543 + 86.86 |

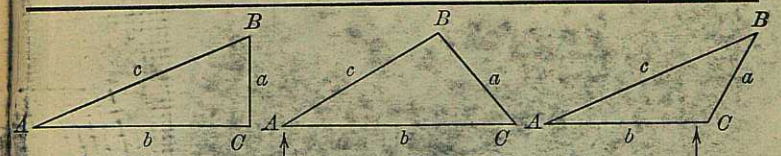
[illegible]f. for 1 ft. of 10° Cur.) = 139.41′ =
[illegible] def. for sta. 542.
[illegible] 2° 30′ for a 10° Curve.
[illegible] 1° 50½′ for a 10° Curve.



| Angle. ° ′ | Sin. | Tan. | Sec. | Cosec. | Cotg. | Cosin. | ° ′ |
|---|---|---|---|---|---|---|---|
| 32 | .5299 | .6249 | 1.1792 | 1.887 | 1.600 | .84805 | 58 |
| 10 | .5324 | .6289 | 1.1813 | 1.878 | 1.590 | .84650 | 50 |
| 20 | .5348 | .6330 | 1.1835 | 1.870 | 1.580 | .84495 | 40 |
| 30 | .5373 | .6371 | 1.1857 | 1.861 | 1.570 | .84339 | 30 |
| 40 | .5398 | .6412 | 1.1879 | 1.853 | 1.560 | .84182 | 20 |
| 50 | .5422 | .6453 | 1.1901 | 1.844 | 1.550 | .84025 | 10 |
| 33 | .5446 | .6494 | 1.1924 | 1.836 | 1.540 | .83867 | 57 |
| 10 | .5471 | .6536 | 1.1946 | 1.828 | 1.530 | .83708 | 50 |
| 20 | .5495 | .6577 | 1.1969 | 1.820 | 1.520 | .83549 | 40 |
| 30 | .5519 | .6619 | 1.1992 | 1.812 | 1.511 | .83389 | 30 |
| 40 | .5544 | .6661 | 1.2015 | 1.804 | 1.501 | .83228 | 20 |
| 50 | .5568 | .6703 | 1.2039 | 1.796 | 1.492 | .83066 | 10 |
| 34 | .5592 | .6745 | 1.2062 | 1.788 | 1.483 | .82904 | 56 |
| 10 | .5616 | .6787 | 1.2086 | 1.781 | 1.473 | .82741 | 50 |
| 20 | .5640 | .6830 | 1.2110 | 1.773 | 1.464 | .82577 | 40 |
| 30 | .5664 | .6873 | 1.2134 | 1.766 | 1.455 | .82413 | 30 |
| 40 | .5688 | .6916 | 1.2158 | 1.758 | 1.446 | .82248 | 20 |
| 50 | .5712 | .6959 | 1.2183 | 1.751 | 1.437 | .82082 | 10 |
| 35 | .5736 | .7002 | 1.2208 | 1.743 | 1.428 | .81915 | 55 |
| 10 | .5760 | .7046 | 1.2233 | 1.736 | 1.419 | .81748 | 50 |
| 20 | .5783 | .7089 | 1.2258 | 1.729 | 1.411 | .81580 | 40 |
| 30 | .5807 | .7133 | 1.2283 | 1.722 | 1.402 | .81412 | 30 |
| 40 | .5831 | .7177 | 1.2309 | 1.715 | 1.393 | .81242 | 20 |
| 50 | .5854 | .7221 | 1.2335 | 1.708 | 1.385 | .81072 | 10 |
| 36 | .5878 | .7265 | 1.2361 | 1.701 | 1.376 | .80902 | 54 |
| 10 | .5901 | .7310 | 1.2387 | 1.695 | 1.368 | .80730 | 50 |
| 20 | .5925 | .7355 | 1.2413 | 1.688 | 1.360 | .80558 | 40 |
| 30 | .5948 | .7400 | 1.2440 | 1.681 | 1.351 | .80386 | 30 |
| 40 | .5972 | .7445 | 1.2466 | 1.675 | 1.343 | .80212 | 20 |
| 50 | .5995 | .7490 | 1.2494 | 1.668 | 1.335 | .80038 | 10 |
| 37 | .6018 | .7536 | 1.2521 | 1.662 | 1.327 | .79864 | 53 |
| 10 | .6041 | .7581 | 1.2549 | 1.655 | 1.319 | .79688 | 50 |
| 20 | .6065 | .7627 | 1.2577 | 1.649 | 1.311 | .79512 | 40 |
| 30 | .6088 | .7673 | 1.2605 | 1.643 | 1.303 | .79335 | 30 |
| 40 | .6111 | .7720 | 1.2633 | 1.636 | 1.295 | .79158 | 20 |
| 50 | .6134 | .7766 | 1.2661 | 1.630 | 1.288 | .78980 | 10 |
| 38 | .6157 | .7813 | 1.2690 | 1.624 | 1.280 | .78801 | 52 |
| 10 | .6180 | .7860 | 1.2719 | 1.618 | 1.272 | .78622 | 50 |
| 20 | .6202 | .7907 | 1.2748 | 1.612 | 1.265 | .78442 | 40 |
| 30 | .6225 | .7954 | 1.2778 | 1.606 | 1.257 | .78261 | 30 |
| 40 | .6248 | .8002 | 1.2808 | 1.601 | 1.250 | .78079 | 20 |
| 50 | .6271 | .8050 | 1.2838 | 1.595 | 1.242 | .77897 | 10 |
| | Cosin. | Cotg. | Cosec. | Sec. | Tan. | Sin. | Angle |

| Angle. ° ′ | Sin. | Tan. | Sec. | Cosec. | Cotg. | Cosin. | ° ′ |
|---|---|---|---|---|---|---|---|
| 39 | .6293 | .8098 | 1.2868 | 1.589 | 1.235 | .77715 | 51 |
| 10 | .6316 | .8146 | 1.2898 | 1.583 | 1.228 | .77531 | 50 |
| 20 | .6338 | .8195 | 1.2929 | 1.578 | 1.220 | .77347 | 40 |
| 30 | .6361 | .8243 | 1.2959 | 1.572 | 1.213 | .77162 | 30 |
| 40 | .6383 | .8292 | 1.2991 | 1.567 | 1.206 | .76977 | 20 |
| 50 | .6406 | .8342 | 1.3022 | 1.561 | 1.199 | .76791 | 10 |
| 40 | .6428 | .8391 | 1.3054 | 1.556 | 1.192 | .76604 | 50 |
| 10 | .6450 | .8441 | 1.3086 | 1.550 | 1.185 | .76417 | 50 |
| 20 | .6472 | .8491 | 1.3118 | 1.545 | 1.178 | .76229 | 40 |
| 30 | .6494 | .8541 | 1.3151 | 1.540 | 1.171 | .76041 | 30 |
| 40 | .6517 | .8591 | 1.3184 | 1.535 | 1.164 | .75851 | 20 |
| 50 | .6539 | .8642 | 1.3217 | 1.529 | 1.157 | .75661 | 10 |
| 41 | .6561 | .8693 | 1.3251 | 1.524 | 1.150 | .75471 | 49 |
| 10 | .6583 | .8744 | 1.3284 | 1.519 | 1.144 | .75280 | 50 |
| 20 | .6604 | .8796 | 1.3318 | 1.514 | 1.137 | .75088 | 40 |
| 30 | .6626 | .8847 | 1.3352 | 1.509 | 1.130 | .74896 | 30 |
| 40 | .6648 | .8899 | 1.3386 | 1.504 | 1.124 | .74703 | 20 |
| 50 | .6670 | .8952 | 1.3421 | 1.499 | 1.117 | .74509 | 10 |
| 42 | .6691 | .9004 | 1.3456 | 1.494 | 1.111 | .74314 | 48 |
| 10 | .6713 | .9057 | 1.3492 | 1.490 | 1.104 | .74120 | 50 |
| 20 | .6734 | .9110 | 1.3527 | 1.485 | 1.098 | .73924 | 40 |
| 30 | .6756 | .9163 | 1.3563 | 1.480 | 1.091 | .73728 | 30 |
| 40 | .6777 | .9217 | 1.3600 | 1.476 | 1.085 | .73531 | 20 |
| 50 | .6799 | .9271 | 1.3636 | 1.471 | 1.079 | .73333 | 10 |
| 43 | .6820 | .9325 | 1.3673 | 1.466 | 1.072 | .73135 | 47 |
| 10 | .6841 | .9380 | 1.3711 | 1.462 | 1.066 | .72937 | 50 |
| 20 | .6862 | .9435 | 1.3748 | 1.457 | 1.060 | .72737 | 40 |
| 30 | .6884 | .9490 | 1.3786 | 1.453 | 1.054 | .72537 | 30 |
| 40 | .6905 | .9545 | 1.3824 | 1.448 | 1.048 | .72337 | 20 |
| 50 | .6926 | .9601 | 1.3863 | 1.444 | 1.042 | .72136 | 10 |
| 44 | .6947 | .9657 | 1.3902 | 1.440 | 1.036 | .71934 | 46 |
| 10 | .6967 | .9713 | 1.3941 | 1.435 | 1.030 | .71732 | 50 |
| 20 | .6988 | .9770 | 1.3980 | 1.431 | 1.024 | .71529 | 40 |
| 30 | .7009 | .9827 | 1.4020 | 1.427 | 1.018 | .71325 | 30 |
| 40 | .7030 | .9884 | 1.4061 | 1.422 | 1.012 | .71121 | 20 |
| 50 | .7050 | .9942 | 1.4101 | 1.418 | 1.006 | .70916 | 10 |
| | .7071 | 1. | 1.414 | 1.414 | 1. | .70711 | 45 |
| | Cosin. | Cotg. | Cosec. | Sec. | Tan. | Sin. | Angle |

# TRIGONOMETRIC FORMULÆ




Right Triangle — Oblique Triangles

## Solution of Right Triangles

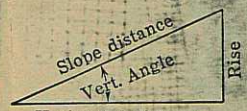
For Angle $A$. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

| Given | Required | |
|---|---|---|
| $a, b$ | $A, B, c$ | $\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} =$ |
| $a, c$ | $A, B, b$ | $\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)(c-a)}$ |
| $A, a$ | $B, b, c$ | $B = 90° - A, b = a \cot A, c = \frac{a}{\sin A}$ |
| $A, b$ | $B, a, c$ | $B = 90° - A, a = b \tan A, c = \frac{b}{\cos A}$ |
| $A, c$ | $B, a, b$ | $B = 90° - A, a = c \sin A, b = c \cos A$ |

## Solution of Oblique Triangles

| Given | Required | |
|---|---|---|
| $A, B, a$ | $b, c, C$ | $b = \frac{a \sin B}{\sin A}, C = 180° - (A + B), c$ |
| $A, a, b$ | $B, c, C$ | $\sin B = \frac{b \sin A}{a}, C = 180° - (A + B)$ |
| $a, b, C$ | $A, B, c$ | $A + B = 180° - C, \tan \frac{1}{2}(A - B) = \frac{(a-b}{}$ <br> $c = \frac{a \sin C}{\sin A}$ |
| $a, b, c$ | $A, B, C$ | $s = \frac{a+b+c}{2}, \sin \frac{1}{2} A = \sqrt{\frac{(s-b)(s-c)}{b c}}$, <br> $\sin \frac{1}{2} B = \sqrt{\frac{(s-a)(s-c)}{a c}}, C =$ |
| $a, b, c$ | Area | $s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(}$ |
| $A, b, c$ | Area | area $= \frac{b c \sin A}{2}$ |
| $A, B, C, a$ | Area | area $= \frac{a^2 \sin B \sin C}{2 \sin A}$ |

## REDUCTION TO HORIZONTAL




Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft. Horizontal distance also = Slope distance minus slope distance times (1 − cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10′ = .9959. 1 − .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 − 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance $= 302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

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